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The study described in this research report concerned tracing the development of language proficiency in the same group of subjects from kindergarten through Grade 9. The research was based on a study of the patterns and behavior of the subjects' speech and writing and their competence in reading and listening. Such information is useful in curriculum planning and in developing teaching methods. This study can also contribut to a better understanding of the difficulties and successes human beings encounter in developing power over language in its major aspects -- speaking, writing, reading, and listening.

The following hypotheses are among those which were tested: subjects who have developed skill in the spoken language also develop the skills of writing, reading, and listening more fully than those without spoken language skill; subjects with highest school attendance records will rank high on development of skill in language; subjects who have the most interaction with other persons will develop language skills more rapidly than those of limited contact; subjects from high socio-economic status will develop language more rapidly and competently than those of lower status.

Several significant features emerged from the work described in this report. It appears that the greatest measure of language proficiency is not basic sentence pattern, but what is done to achieve flexibility within pattern. Competence in spoken language ha proved to be a necessary base for competency in writing and reading. Finally, the persistently parallel variation of language proficidncy and socio-economic status should not be overlooked.

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GRADES SEVEN, EIGHT, AND NINE

Walter Loban
University of California
Berkeley, 1964

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LANGUAGE ABILITY: GRADES SEVEN, EIGHT, AND NINE

Cooperative Research Project No. 1131

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Supervisor of the Teaching of English

The University of California at Berkeley

March 1, 1964

The research reported herein was supported by the
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ABSTRACT

Title:	LANGUAGE ABILITY: GRADES SEVEN, EIGHT, AND NINE
Investigator:	Walter Loban
Institution:	University of California at Berkeley
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BACKGROUND

The problem has been to continue tracing the development of language proficiency in the same group of subjects who were originally selected in kindergarten through three years of junior high school, grades seven, eight, and nine, based upon a study of the linguistic patterns and syntactical behaviors of the subjects' speech and writing and their competence in reading and listening. Such information, apart from its contribution to knowledge of man's behavior, provides useful information for curriculum planning and teaching methods in education. This study has also yielded information that will contribute knowledge to the field of linguistics, that will help curriculum workers in the language arts and English, and that will throw light on the difficulties and successes human beings encounter in developing power over language in its major aspects--speaking, writing, reading, and listening.

OBJECTIVES

The following hypotheses are among those which have been tested:

1. Subjects who have developed skill in the spoken language, using pitch, juncture, and stress effectively for purposes of oral communication, also develop the skills of writing, reading, and listening more fully than those who have not developed the same degree of skill in the spoken language.

2. Subjects who are proficient in language use more optional grammatical transformations in their sentence structure and are more accurate in their obligatory grammatical transformations. Subjects lacking in proficiency use fewer optional transformations and more inaccurate obligatory transformations.

3. Subjects with the highest degree of ability in speech and writing use a more varied and flexible pattern of syntax than subjects with less ability. The high ability subjects will also listen and read with more proficiency than the second groups of subjects.

4. Although the relationships of ability in speech, writing, reading, and listening will be positive for the subjects, the development of these abilities in individuals will not take place in an even manner. For example, some subjects will make notable progress in reading or listening at a time when very small gains in power over speech or writing take place. There will not be a uniform development of all four areas of the language arts even though there will be a tendency for overall development to follow the gains of each individual subject.

5. Those subjects who manifest the highest skill in language ability will also be those who use relational words (e.g., moreover, although, because, etc.) more often and more accurately than the other subjects.

6. Subjects with highest ratings on school attendance will also rank highest on development of skill in language.

7. Predictable stages of growth in the development of language will emerge and can be identified for all subjects. The order and duration of these stages of language growth will vary with individual subjects.

8. Those subjects who have the most interaction with other persons will develop the skills of language more rapidly than those whose contacts with other persons are more limited.

9. Subjects from high socio-economic status will develop language more rapidly and to a greater competency than subjects from low socio-economic status.

10. Deviations from accepted standards of English usage will be significantly less frequent for subjects of high socio-economic status than for those of low socio-economic status.

11. Subjects with high ability in language will express more frequently than other subjects such matters as tentativeness and supposition. Their language will reflect flexibility rather than rigidity of thinking and reacting.

PROCEDURE

The population sample is a representative cross-section of the school population of Oakland, California, carefully stratified according to factors bearing on language. The original sample in kindergarten was 338. In grade nine there were still 220 subjects remaining in the study. This research is part of a larger longitudinal study based on a developmental design with the hypotheses and methods subject to modification during the course of a continuing study.

Data gathered are yearly transcripts of the subjects' speech, writing, reading, and listening, along with health, mental ability, socio-economic status, school achievement, and school attendance. The transcripts are gathered in situations identical for all subjects; speech is recorded on audographs and tape recorders, typed by specially trained typists, and analyzed according to codes developed from the initial years of this study. The method of analysis employs analysis developed by research workers and linguists at a conference held at the University of Indiana in 1959 and sponsored by the Office of Education.

As the first step in the statistical analysis, the recorded spoken language of each subject is typed and then analyzed for total amount of language, total number of communication units, total words in communication units, average words per communication unit, mazes, words in mazes, and average words per maze. Further types of analysis done for each subject include coherence, subordination, deviations from accepted English usage, style of speech, control of writing, amount and quality of reading, diversity and height of vocabulary, health in relation to language, and functions of language used. In addition to the various types of analysis done on each subject, a number of subgroups have been selected and studied more intensively. Particular care has been exercised to use statistical techniques whenever they are suitable and to avoid them whenever they do not contribute to a useful analysis of the data.

TABLE OF CONTENTS

Page

CHAPTER ONE

INTRODUCTION 1

PURPOSES OF THE INVESTIGATION 1

THE SYMBOLIC NATURE OF LANGUAGE 1

GUIDING THEORY OF THIS RESEARCH 4

1. Language Involves Two Kinds of Meaning. 4
2. Language Growth Depends upon a Complex of Factors 5
3. Language Is a Means of Adjustment 7
4. Language Proficiency Develops through a Sequence of Attainments. 8
5. Language Is Related to Socio-economic Status and to Home Environment 9
6. A Close Relationship Exists between Language and Intelligence. 9
7. Instruction Can Increase Language Proficiency 10
8. School Attendance and Social Interaction Are Related to Language Proficiency 10
9. Skill in Different Classifications of Symbolic Language Usually Varies in the Same Direction. 11

RESEARCH DESIGN AND PROCEDURES 12

DESIGN OF THE RESEARCH, A BRIEF OVERVIEW 12

LIMITING FACTORS 13

THE SAMPLE 16

THE DATA COLLECTED 17

TECHNIQUES 19

1. New Methods of Analysis 19

Page

Segmenting the Subjects' Oral Language . . . 19

- *The phonological unit* . . . 21
- *The communication unit* . . . 22
- *The language maze* . . . 23
- *First Level of Analysis* . . . 26
- *Second Level of Analysis* . . . 31

Function of Communication Units . . . 32

Classification of Oral Language Style . . . 33

2. *Methods of Analysis Derived from Other Research* . . . 34

Amount of Subordination . . . 34

Difficulties with Conventional Usage and Grammar . . . 39

Vocabulary Measured by Diversity . . . 40

Vocabulary Measured by Word Frequencies . . . 41

3. *Tests* . . . 42

Vocabulary . . . 42

Intelligence . . . 43

Use of Subordinators . . . 43

4. *Ratings and Indices* . . . 43

Teachers' Ratings of Subjects . . . 44

Index of Writing Ability . . . 44

School Attendance . . . 46

Socio-economic Status . . . 47

Energy and Health . . . 51

VALIDITY AND RELIABILITY . . . 51

SUMMARY . . . 53

Page

CHAPTER TWO

FINDINGS 55

FLUENCY 55

SUMMARY ON FLUENCY 95

EFFECTIVENESS AND CONTROL 96

1. First Level Analysis: Ability to Use and Vary the Structural Patterns of English 97

2. Second Level Analysis: Dexterity in Varying Elements within the Structural Patterns. 105

Movables 105

Nominals Used as Subjects 108

Nominals Used as Complements 110

Nominals Used as Objects of Prepositions and Verbals . . . 110

3. Ability to Express Tentative Thinking by Means of Provisional and Conditional Statements. 112

4. Competence with Reading and Writing. 116

Reading. 116

Writing. 122

5. Coherence through the Use of Subordination 129

The Weighted Index of Subordination. 133

The Chomsky Technique of Transformational Grammar. 137

Findings. 141
Summary 143

6. Coherence through the Use of Subordinating Connectives . . 146

7. Coherence through Control of Mazes 150

8. Coherence of Spoken Style. 151

SUMMARY ON EFFECTIVENESS AND CONTROL 152

Page

CHAPTER THREE

MASTERY OF CONVENTIONAL USAGE AND GRAMMAR 153

THE SAMPLE 154

METHOD OF SELECTION 154

STATISTICAL PROBLEMS AND METHODS OF ANALYSIS 156

CHAPTER FOUR

INTERRELATIONS AMONG THE LANGUAGE ARTS. 207

CHAPTER FIVE

CONCLUSIONS 225

SUMMARY OF FINDINGS 229

1. Fluency with Language 229

2. Effectiveness and Control 231

Structural Patterns. 231

Elements within the Structural Patterns 232

Tentative Thinking through the Use of Provisional and Conditional Statements 233

Figurative Language and Generalizations 233

Reading and Writing 233

Coherence through the Use of Subordination 234

Coherence through the Use of Subordinating Connectives . . 235

Coherence through Control of Mazes 235

Coherence of Spoken Style. 236

Page

SUMMARY OF MASTERY OF CONVENTIONAL USAGE AND GRAMMAR 236

SUMMARY OF INTERRELATIONS AMONG THE LANGUAGE ARTS 238

A CONCLUDING STATEMENT 239

APPENDIX 242

BIBLIOGRAPHY 245

TABLES

Page

Table 1a Four Sample Populations Using the Seven Categories of the Minnesota Occupational Scale Over a Period of Twenty-Five Years 49

Table 1b Socio-Economic Status by Ethnic Group Total Group of Subjects in Grade Seven 50

Table 2a Amount of Language: Total Group of Subjects Measures of Central Tendency and Variability for Words, Communication Units, and Mazes Grades Kindergarten through Nine 57

Table 2b Amount of Language: Highest Group of Subjects Measures of Central Tendency and Variability for Words, Communication Units, and Mazes Grades Kindergarten through Nine 58

Table 2c Amount of Language: Lowest Group of Subjects Measures of Central Tendency and Variability for Words, Communication Units, and Mazes Grades Kindergarten through Nine 59

Table 3 Relation of Raw Figures on Mazes and Words in Mazes to Total Words, Words in Units, and Communication Units High, Low, and Total Group of Subjects Grades Kindergarten through Nine 70

Table 4 Number of Communication Units for High and Low Groups Median, Inter-quartile Range, and Total Range Grades Kindergarten through Nine 75

Table 5 Consistency of Linguistic Performance: Correlations of Amount of Language from Year to Year on Two Measures of Linguistic Performance. 77

Table 6 Measures of Central Tendency and Variability for Vocabulary Test and Teacher's Rating Total Group of Subjects in Kindergarten. 78

Table 7 Type-Token Comparison of High and Low Groups for Nine 100-Word Segments of Spoken Language Grades Kindergarten through Nine 82

Table 8a Measurement of Vocabulary Height for High and Low Groups Medians of Words in First 100-Word Type-Token Segment Thorndike-Lorge Word Frequency Count Grades Kindergarten through Nine 89

Page

Table 8b Measurement of Vocabulary Height for High and Low Groups
Medians of Words in Second 100-Word Type-Token Segment
Thorndike-Lorge Word Frequency Count
Grades Kindergarten through Nine 90

Table 8c Measurement of Vocabulary Height for High and Low Groups
Medians of Words in Third 100-Word Type-Token Segment
Thorndike-Lorge Word Frequency Count
Grades Kindergarten through Nine 91

Table 8d Measurement of Vocabulary Height for High and Low Groups
Medians of Words in Fourth 100-Word Type-Token Segment
Thorndike-Lorge Word Frequency Count
Grades Kindergarten through Nine 92

Table 9 Measurement of Vocabulary Height for High and Low Groups
Medians of Words in First, Second, Third, and Fourth
100-Word Type-Token Segments Combined
Thorndike-Lorge Word Frequency Count
Grades Kindergarten through Nine 93

Table 10 First Level Analysis:
Relative Proportions of Structural Patterns
According to Percent of Pattern Used in Total Transcript
Median and Inter-quartile Range of High and Low Groups
Grades Kindergarten through Nine 100

Table 11 Number of Subjects in High and Low Groups Actually Using
The More Uncommon Sentence Patterns in Oral Interviews
Grades Kindergarten through Nine 104

Table 12 Dexterity in Varying Elements within Structural Patterns:
Movables
Medians of Various Movables Used by High and Low Groups
Grades Kindergarten through Six 107

Table 13 Dexterity in Varying Elements within Structural Patterns:
Nominals Used as Subjects
Medians of Various Nominals Used by High and Low Groups
Grades Kindergarten through Six 109

Table 14 Dexterity in Varying Elements within Structural Patterns:
Nominals Used as Complements
Medians of Various Nominals Used by High and Low Groups
Grades Kindergarten through Six 111

Table 15 Functions of Language: Classification of Low and High Groups
in Eight Categories of Language Function
Grades Three, Four, Five, and Six 115

Page

Table 16 Comparison of Scores on Reading Achievement Using Stanford and California Reading Achievement Tests High, Low, and Total Group of Subjects Grades Four through Eight 117

Table 17 Socio-Economic Comparison of Total Group of Subjects on Reading Achievement Above or Below Chronological Age Grades Four through Nine 121

Table 18 Ratings of Written Language High, Low, and Total Group of Subjects Grades Four through Nine 123

Table 19 Socio-Economic Comparison of Total Group of Subjects on Ratings of Written Language Grades Four through Nine 125

Table 20 First Level Analysis: Relative Proportions of Structural Patterns According to Per Cent of Pattern Used in Written Language Median and Inter-quartile Range of High and Low Groups Grades Four through Nine 127

Table 21 Number of Subjects in High and Low Groups Actually Using The More Uncommon Sentence Patterns in Written Language Grades Four through Nine 128

Table 22 Subordination Index: Incidence of Subordination Weighted According to Use of Dependent Clauses and Verbal Phrases in Oral Language High, Low, and Random Group of Subjects Grades Kindergarten through Nine 134

Table 23 Subordination Index: Incidence of Subordination Weighted According to Use of Dependent Clauses and Verbal Phrases in Written Language High, Low, and Total Group of Subjects Grades Four through Nine 136

Table 24 Socio-Economic Comparison of Total Group of Subjects on Ability to Use Subordinating Connectives Grades Five through Nine 149

Table 25 Total Number of Words in Communication Units High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 159

Table 26 Average Number of Words per Communication Unit High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 160

Page

Table 27 Median Scores and Range on Selected Measures at Grade Six High Caucasian, Low Caucasian, and Low Negro Groups . . . 162

Table 28 Socio-Economic Status at Grade Nine High Caucasian, Low Caucasian, and Low Negro Groups . . . 163

Table 29 Adjusted Mean on Deviations by High Caucasian Group Per 1000 Words of Spoken Volume Grades Kindergarten through Nine 167

Table 30 Adjusted Mean on Deviations by Low Caucasian Group Per 1000 Words of Spoken Volume Grades Kindergarten through Nine 168

Table 31 Adjusted Mean on Deviations by Low Negro Group Per 1000 Words of Spoken Volume Grades Kindergarten through Nine 169

Table 32a Interrelations among Reading, Writing, and Oral Language Total Group of Subjects in Grade Four 209

Table 32b Interrelations among Reading, Writing, and Oral Language Total Group of Subjects in Grade Six 210

Table 32c Interrelations among Reading, Writing, and Oral Language Total Group of Subjects in Grade Eight 211

Table 33 Relation between Oral Language and Writing Total Group of Subjects Grades Four, Six, and Eight 221

Table 34 Relation between Listening and Writing Total Group of Subjects in Grade Eight 225

FIGURES

Page

Figure 1a Total Number of Words in Transcript High, Low, and Total Group of Subjects Grades Kindergarten through Nine 60

Figure 1b Total Number of Communication Units in Transcript High, Low, and Total Group of Subjects Grades Kindergarten through Nine 61

Figure 1c Total Number of Words in Communication Units High, Low, and Total Group of Subjects Grades Kindergarten through Nine 62

Figure 1d Average Number of Words per Communication Unit High, Low, and Total Group of Subjects Grades Kindergarten through Nine 63

Figure 1e Total Number of Mazes in Transcript High, Low, and Total Group of Subjects Grades Kindergarten through Nine 64

Figure 1f Total Number of Words in Mazes High, Low, and Total Group of Subjects Grades Kindergarten through Nine 65

Figure 1g Average Number of Words per Maze High, Low, and Total Group of Subjects Grades Kindergarten through Nine 66

Figure 2a Percentage of Words in Mazes in Relation to Total Words in Transcript High, Low, and Total Group of Subjects Grades Kindergarten through Nine 71

Figure 2b Percentage of Mazes in Relation to Total Words in Communication Units High, Low, and Total Group of Subjects Grades Kindergarten through Nine 72

Figure 2c Percentage of Mazes in Relation to Communication Units High, Low, and Total Group of Subjects Grades Kindergarten through Nine 73

Figure 3 Medians for Number of Communication Units High, Low, and Total Group of Subjects Grades Kindergarten through Nine 76

Page

Figure 4 The Frequency Distribution for Scores on the Kindergarten Vocabulary Test (100 items) Total Group of Subjects 79

Figure 5a Type-Token Comparison of High and Low Groups Median Number of Types for First Segment Grades Kindergarten through Nine. 83

Figure 5b Type-Token Comparison of High and Low Groups Median Number of Types for Second Segment Grades Kindergarten through Nine 84

Figure 5c Type-Token Comparison of High and Low Groups Median Number of Types for Third Segment Grades Kindergarten through Nine 85

Figure 5d Type-Token Comparison of High and Low Groups Median Number of Types for Fourth Segment Grades Kindergarten through Nine 86

Figure 6 Comparison of Scores on Reading Achievement Using Stanford and California Reading Achievement Tests High, Low, and Total Group of Subjects Grades Four, Six, and Eight 118

Figure 7 Incidence of Subordination Frequency of Three Types of Subordination High, Low, and Random Group of Subjects Grades Kindergarten through Six 132

Figure 8 Median Scores on Ability to Use Subordinating Connectives High, Low, and Total Group of Subjects Grades Five through Nine 147

Figure 9 Number of 1A Deviations per 1000 Words of Spoken Volume High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 171

Figure 10 Number of 1B Deviations per 1000 Words of Spoken Volume High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 174

Figure 11 Number of 1C Deviations per 1000 Words of Spoken Volume High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 176

Figure 12 Number of 1D Deviations per 1000 Words of Spoken Volume High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 178

Page

Figure 13 Number of 1E Deviations per 1000 Words of Spoken Volume High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 180

Figure 14 Number of 2A Deviations per 1000 Words of Spoken Volume High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 182

Figure 15 Number of 3A Deviations per 1000 Words of Spoken Volume High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 185

Figure 16 Number of 3B Deviations per 1000 Words of Spoken Volume High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 187

Figure 17 Number of 4A Deviations per 1000 Words of Spoken Volume High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 189

Figure 18 Number of 4B Deviations per 1000 Words of Spoken Volume High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 191

Figure 19 Number of 5A Deviations per 1000 Words of Spoken Volume High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 193

Figure 20 Number of 6A Deviations per 1000 Words of Spoken Volume High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 196

Figure 21 Number of 6B Deviations per 1000 Words of Spoken Volume High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 198

Figure 22 Number of 7 Deviations per 1000 Words of Spoken Volume High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 200

Figure 23 Number of 8 Deviations per 1000 Words of Spoken Volume High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 202

Figure 24 Total Number of Deviations per 1000 Words of Spoken Volume High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 204

Page

Figure 25 Total Number of Deviations per 1000 Words of Spoken Volume with Deviations of Ethnic Origin (1A, 1D, 1E, 8) Subtracted High Caucasian, Low Caucasian, and Low Negro Groups Grades Kindergarten through Nine 205

Figure 26a Relation between Reading and Writing Written Language Scores Compared to Reading Achievement Above or Below Chronological Age Total Group of Subjects in Grade Four 213

Figure 26b Relation between Reading and Writing Written Language Scores Compared to Reading Achievement Above or Below Chronological Age Total Group of Subjects in Grade Six 214

Figure 26c Relation between Reading and Writing Written Language Scores Compared to Reading Achievement Above or Below Chronological Age Total Group of Subjects in Grade Eight 215

Figure 27a Relation between Oral Language and Reading Scattergram of Average Teacher's Rating and Reading Achievement Above or Below Chronological Age Total Group of Subjects in Grade Four 217

Figure.27b Relation between Oral Language and Reading Scattergram of Average Teacher's Rating and Reading Achievement Above or Below Chronological Age Total Group of Subjects in Grade Six 218

Figure 27c Relation between Oral Language and Reading Scattergram of Average Teacher's Rating and Reading Achievement Above or Below Chronological Age Total Group of Subjects in Grade Eight 219

Figure 28 Relation between Oral Language and Listening Scattergram of Average Teacher's Rating and Converted Score on STEP Listening Test Total Group of Subjects in Grade Eight 223

Figure 29 Relation between Reading and Listening Scattergram of Converted Score on STEP Listening Test and Reading Achievement Above or Below Chronological Age Total Group of Subjects in Grade Eight 224

CHAPTER ONE

INTRODUCTION

PURPOSES OF THE INVESTIGATION

The research reported in this monograph is a study of the language used by children in the kindergarten and first nine years of school with special emphasis on their development in grades seven, eight, and nine. It is concerned with their use and control of language, their effectiveness in communication, and with the relations among their oral, written, listening, and reading uses of language. It is one part of a longer study covering the same subjects throughout the elementary and secondary school years.

The study is also concerned with developing fundamental methods of analysis to aid the scientific study of children's language and to locate significant features of language worthy of further study.

The major questions forming the purposes and dimensions of this longitudinal research were these:

. . . Just as in physical development, are there predictable stages of growth in language?

. . . Can definite sequences in language development be identified?

. . . How do children vary in ability with language and gain proficiency in using it?

THE SYMBOLIC NATURE OF LANGUAGE

A fundamental difference between the animal and the human world is linguistic. Animals can use and understand signs; they cannot cope with symbols. A growl, a call, even a green traffic light--signs like these, directly tied to a concrete situation, can take on meaning for animals as well as for human beings. Symbols, however, are instruments of complicated thought. They are not necessarily tied to the immediate situation, for by means of symbols human beings can allude to objects or concepts even in the absence of those objects or concepts. The language human beings use for discourse is therefore a system of arbitrary symbols used to designate concepts.

This language system can be enlarged to name new concepts, such as camouflage in 1918, jet plane in 1960. Response to a linguistic symbol in the system is contingent upon the symbols with which it is combined. For instance, in English-speaking communities, response to the symbol crop differs in the following three sets of utterances because of the accompanying symbols:

The stone stuck in the bird's crop.
She carried a riding crop in her hand.
The shepherd watched his sheep crop the grass.

The next two utterances elicit strikingly different responses because of a single symbol, not.

Go away!
Do not go away!

The signs used by animals never become language for discourse because animals are incapable of separating the signs from the particular concrete situations in which the signs are embedded. No evidence of animals having made the leap from signs to symbolic language, to words freed from situations and arranged in systems, has ever been verified.[1] Until the day she learned *water* as a symbol and thereby *disassociated it from any particular wetness*, Helen Keller lived the life of a gifted animal using signs. On that day, in a spectacular leap, she extended her potential limits to the mental horizon of the human family. Human beings use signs, of course, but they also use symbols. Without symbolic language there would be no formation of concepts, no dominance of abstract knowledge over concrete knowledge. Without symbolic language, there would be among men no civilization, no passing on of cultures.

The definition of language adopted for this research is one, therefore, which views translating experience into symbol systems as a basic and uniquely human activity. At the same time, a definition of language must also acknowledge that language used for communication is *learned*, an acquired cultural function rather than an instinctive behavior. Sapir's definition includes all these considerations: "Language is a purely human and non-instinctive method of communicating ideas, emotions, and desires by means of a system of voluntarily produced symbols."[2] The acquisition of symbolic language and the development of proficiency with it constitute, therefore, a significant problem for educational research.[3]

---

[1] A summary of research on behavior in animals in relation to language may be found in Roger Brown, *Words and Things* (Glencoe, Illinois: The Free Press; 1958), Chapter V, "The Comparative Psychology of Linguistic Reference," pp. 155-193.

[2] Edward Sapir, *Language*. New York: Harcourt, Brace; 1921, p. 8. (Susanne).

[3] K. Langer, in *Problems of Art* (New York: Scribners; 1957, pp. 21-26), makes an important point on the limits of *language*. She believes it cannot express subjective feelings and emotions, the "inward reality" of human beings; thus *art* of all kinds does this even more complex communication.

For children acquisition of language is more than a passive process of association. Symbolic language, in childhood, is a highly active form of exploratory and adaptive behavior without which survival, though still possible, would be on the animal level. This research, therefore, views the development of language as a basic exploratory and adaptive behavior used by human beings for survival, communication, and self-expression.

GUIDING THEORY OF THIS RESEARCH

The nine brief sections which follow express the theoretical considerations with which this research began. They represent the thinking and the presuppositions determining choices that had to be made among the range of possibilities in carrying out this research.

1. Language Involves Two Kinds of Meaning.

Linguistic research has usually emphasized form rather than content. In his investigations, the linguist avoids considerations of meaning (in the usual sense of the word); he is usually concerned with what he calls differential meaning. He feels that referential meaning becomes confused with all the other systems of culture. He wants to describe the structure of language in its own terms; only then does he care to consider how these linguistic patterns relate to other systems of the culture.

On the other hand, some scholars have maintained that insight into the character and function of human speech is not possible if language is viewed with such a degree of objectivity. They believe that a language is not simply a system of forms, that the words and rules which make up a language really exist only in the act of connected speech. "Language must be looked upon as an energeia rather than as an ergon. It is not a ready-made thing but a continuous process; it is the ever-repeated labor of the human mind to utilize articulated sounds to express thought."[1] These latter scholars point out that in the past all complex facts were thought to be an accumulation, an aggregate of simple data. Modern gestalt psychology, they assert, has criticized this conception, opening the way for a view of language as "an indissoluble unity which cannot be divided into the two independent and isolated factors, form and matter."[2] Modern linguistics, they believe, should not be concerned only with the nature of sounds but with the meaningful function of symbols.

But this, again, is a position too far on the side of semantics and too antagonistic to structure. Significance is conveyed by linguistic forms and unless a speaker or writer can handle the forms adequately, he cannot express or understand "significance." Consequently this research emphasizes language both as a means of communication and as a formal system of sounds or markings. Analysis of both semantic and structural meaning will receive attention. Content and form will both be considered, and techniques of research using or combining both will be employed.

2. Language Growth Depends upon a Complex of Factors.

Presumably the development of an individual's proficiency with language depends upon the relation between the physical-biological being and his environment. The child who is acquiring linguistic skill should have vitality and health; he should also have an environment which fosters exploration, an active approach to experience, and a confident attitude toward trying and using language. Thus language development appears to be affected by numerous factors, all varying simultaneously and in complex interrelationships. In the interests of establishing a guiding theory for this research, however, some of these factors have been identified tentatively. An attempt here has been made to list, in the order of their presumed importance, those biological and environmental factors contributing most prominently to language development:

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[1] Ernst Cassirer and W. Von Humboldt. See Ernst Cassirer, Essay on Man. Garden City, New York: Doubleday and Company; 1953, pp. 156-157.

[2] Cassirer, ibid., p. 157.

Environmental Factors

security in relations with parents (or parent surrogates) and other authority symbols

degree of facility in family use of language (usually, but not always, this factor will vary in the same direction as socio-economic status)

amount, variety, and quality of language heard and used in the family (conversation, stories, table talk, etc.)

variety of experience including much interaction with other people and opportunity to verbalize this experience

encouragement and opportunity for self-expression, not only in language but in other ways also

adequate balanced diet (over a period of time)

sufficient rest (over a period of time)

instruction that focuses attention on the principles of effectiveness in language (such instruction would occur as much as possible in problem situations involving the child's interests and drives)

Biological Factors

glandular balance and total biological homeostasis

energy (rate and balance of metabolism)

physical facility in speech production

motor controls of speech organs

visual acuity

hearing acuity

tactile acuity

immunity to disease

It is possible, also, that nervous systems vary biologically in adequacy and in capacity to integrate electro-physical nerve impulses into those patterns by which perceptions become transformed into symbols. Whether or not such variations at the deepest physical levels do or do not exist could be open to some question. However, one can agree that regardless of biological endowment, positive changes in the environmental factors listed above should contribute to improved language skill. Children with the most fortunate combination of both biological and environmental factors should develop controls over symbolic language earlier and more effectively than children with less fortunate combinations of these factors.

3. Language Is a Means of Adjustment.

All living is a process of adjustment, and language is one means by which individuals satisfy needs and accommodate frustrations. Obviously language cannot dispel hunger or sub-zero weather. But since Cro-Magnon Man, the race has had sufficient control over the physical environment to make possible a shift from biological to cultural evolution. With the advent of language, social evolution became possible, an evolution that is much more rapid than biological evolution.

In cultural matters, therefore, where symbols occupy a central position, language is a common means of adjustment, so much so that a child who is either isolated or overly protected may acquire only the lowest levels of language skill. Language develops best in situations where individuals feel a need to express themselves and seek to be understood. (The reverse of this situation also holds true: language power can increase best in situations where individuals have a deep interest in receiving communication, either through listening or reading.) This would mean that children who are, for whatever reason, much alone or who play with only one other child such as a twin, will develop less skill in language than those who have genuine language interaction with other children and adults. This reciprocal reinforcement of language is an important form of adjustment to the social environment.

4. Language Proficiency Develops through a Sequence of Attainments.

Increasing power over language occurs through a series of developing controls of meaningful forms--for instance, the ability to handle pronouns according to convention; the use of subordination instead of coordination to show relationships more adequately; the accurate and consistent use of verb tense; the exact use of relational words such as until, although, however. All these and more, it is believed, develop earlier in some children than in others. The rapidity with which these attainments occur and the order in which they occur among individuals will probably vary, but a general picture of the situation deserves to be revealed empirically. Through research, base lines may be charted for more effective instruction, and for individual children the relative stages of growth can be determined.

Which of such identifiable language attainments will appear early and which ones late? Their order, presumably, will be conditioned by the requirements of language situation as well as by the successful combinations the speaker has already mastered. Regressions will occur in situations of social threat, and previous accomplishments will require relearning in the setting of new, more complicated expressions. Very likely, the order and duration of these stages of growth will vary with individuals. No precise formula can be imposed on this development of language power, but an accurate description should reveal order and pattern rather than obscure accident.

5. Language Is Related to Socio-economic Status and to Home Environment.

As previous research has shown, socio-economic status will be assumed to show a positive relation to language, and the extent to which a child utilizes his linguistic abilities and potential will be influenced by his home environment.[1] His home environment will likewise have a notable effect upon his learning of conventional pronunciation, standard usage, and distinct speech.

6. A Close Relationship Exists between Language and Intelligence.

Proficiency with language and general intelligence, when probed quite deeply, nearly always represent two facets of the same energy.[2] In most instances people express intelligence in the manner of the most successful subjects in Warden's research.[3] In learning to trace a maze they could not see (using a stylus), three groups of his subjects achieved successful mastery with a varying average number of trials:

> those who depended upon the kinesthetic "feel" required 124 trials
>
> those who depended upon visual memory required 68 trials
>
> those who verbalized the details ("right, 3 times," etc.) required 30 trials

Similarly language enables human beings to find more efficient solutions for many problems they encounter in their cultures. Language and intelligent problem-solving appear to be interrelated in many areas of life.

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[1] Dorothea McCarthy, "Child Development: Language," in Walter S. Monroe, ed., Encyclopedia of Educational Research, rev. ed. New York: Macmillan Company; 1950, p. 170.

[2] Exceptions to this are the nonverbal problems solved by such people as artists, carpenters, ballet dancers, automobile drivers, and children, all of whom frequently depend upon direct visual or kinesthetic perception and through this dependence act wisely or appropriately without verbalization.

[3] C. J. Warden, Journal of Experimental Psychology, VII, pp. 243-275.

7. Instruction Can Increase Language Proficiency.

Although instruction cannot very far transcend maturation, it can increase language proficiency and prevent dislocations of language development. Just as the influence of the home facilitates or retards the child's development of language, so can the influence of the school be favorable or unfavorable. Not only can learning be cleared of unrewarding obstacles, it can also be made more efficient, effective, and permanent. Particularly important is a curriculum which does not go against the grain of the child's readiness for the learning of language. And almost in the same breath, it is important to say that instruction should not underestimate the child's readiness to learn a new skill. When children in an arithmetic class cut cardboard pies into thirds and fourths, they learn the symbols of fractions more efficiently, with more understanding, than by a purely verbal presentation. Similarly, good methods of language instruction should increase an individual's proficiency with language.

8. School Attendance and Social Interaction Are Related to Language Proficiency.

Through making himself understood by others and through imitation, the child elaborates basic patterns of syntax he has already learned before entrance into school. Those children who have relatively little interaction with adults or other children have less need to make themselves understood; they have less experience with the elaboration of language patterns used by children who have an active speaking life. Records of school attendance will be of interest in this respect, for they should have a relation to interaction.[1] Important, also, will be indices of the child's social interaction.

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[1] Whether willing attendance at school is a concomitant, cause, or result of language skill is not, however, a question available to the present investigation.

9. Skill in the Different Classifications of Symbolic Language Usually Varies in the Same Direction.

Finally, this research assumes that a positive relationship exists among the various aspects of language--speaking, writing, reading, and listening.

RESEARCH DESIGN AND PROCEDURES

DESIGN OF THE RESEARCH, A BRIEF OVERVIEW

This research is based on a developmental design with the hypotheses and methods subject to modification during the course of a continuing study. The subjects were in 1952 a representative group of 338 kindergarten children. At regular intervals over a period of eleven years, comparable samples of their language have been collected.[1] From this evidence significant features worthy of description and analysis have been identified and studied.

The samples of language--speech, writing, and reading--have been drawn once a year from controlled situations identical for all subjects. Data on listening were collected beginning in the eighth grade. In order that other research workers might use the same procedures for purposes of further application, verification, or refutation, the data have also been collected and analyzed by methods allowing for repetition. Wherever applicable and appropriate, standard procedures of quantitative and statistical description have been used. New methods have been carefully described. Thus it is possible to present the status of the subjects' language ability at equally spaced periods of time. Whether one is interested in normative data for the group or in changes occurring to individuals, the data will provide answers.

In addition to the larger representative group of subjects, two special subgroups have been selected from the total sample. These two subgroups consist of subjects representing extreme deviations from the mean of the total sample.[1] In the first special subgroup are those ranked extremely high in language proficiency; in the second subgroup are those extremely low in language ability. For these two special groups more extensive data have been gathered and analyzed.[2]

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[1] The total longitudinal study has been planned for a period to include the subjects' school years from kindergarten through grade twelve. The monograph reports only the first ten years of this total time period, 1952-1965.

Although this design includes attention to descriptive and normative data, its purpose is also to trace language development and to determine predictive factors. Consequently special attention has been given to the consistency of individual performance and the position of the individual within the total group. Thus the design has a triple focus--the total group, special subgroups, and individuals as they relate to each other within the study.

LIMITING FACTORS

By directing attention solely to the structural elements of language, a research worker can avoid one kind of danger, for cultural, psychological, and sociological factors can easily dissipate the clarity of linguistic findings. Yet, to separate language from its function as symbolic thinking and communication also encounters dangers of limitation. It has been necessary, therefore, in this study to choose carefully among the possibilities both in the grammatical meanings that are signaled by structure and the lexical meanings that are signaled by semantics. This is a problem of the inclusiveness of research design, and the choice has been made in favor of both the differential and referential aspects of language.

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[1] The basis of selection was the average of ten years of teachers' ratings of the subjects' language ability. This criterion was used in lieu of any better or established standards of general language proficiency. By means of this criterion as a temporary way of selecting subgroups, the experimenter proposes to locate empirically more refined evidence of language proficiency. Whenever one of the subjects high or low in the study moved from the area, the next subject in line for the group was used as a replacement.

[2] The N in the two groups will sometimes vary because occasionally a score for some subject will not be available or usable for some specific reason. Usually there are from 24 to 30 subjects in any one subgroup. Three additional subgroups (which should not be confused with the regular high and low groups used throughout this research) were selected for an intensive study of deviations from accepted English usage. N for each of these three groups is 21 in all cases.

A more restricting kind of limitation is to be found in the sampling of the subjects' language. Ideally, many different examples of language procured under a range of various situations would be desirable. In the present research, considerations of cost and time limited the data on oral and written language to single yearly samples. Reading was studied by several tests each year, and in addition a record of the voluntary reading of the subjects has been obtained on a year-by-year basis. Listening was not measured until the junior high school years.

For some aspects, requiring particularly meticulous and expensive computation and analysis, the two subgroups representing the extremes of linguistic ability have been studied and contrasted in lieu of the entire sample. In some instances this is a limitation and in other instances it is a desirable feature of the research design.

Inasmuch as the research reported here is part of a larger study, a few paragraphs will be devoted to an explanation of the context from which the present investigation is drawn. In September of 1952 arrangements were concluded with the administration of the public schools of Oakland, California, to initiate a study of the language development of at least three hundred children entering the kindergarten classes of that school system. With the assistance of the director of research in the Oakland schools, eleven classes of children, 338 individuals in all, were selected from districts representing a complete range of social and economic background for the city. In November of the school year, 1952-53, visits were made to the principals of these schools and to the kindergarten teachers involved; and in January of the same school year, the investigator and his staff started visiting the classes in order to familiarize the children with their presence. In February the investigator and his staff divided the work and began to collect yearly samples of the subjects' oral language. The schools furnished results on tests of reading and arithmetic. All these data will be described more fully in a subsequent section.

The total longitudinal study will continue until 1967, at which time data shall have been gathered and analyzed on all available subjects for a thirteen-year period (grades kindergarten through twelve). Subjects are retained in the study as long as they remain within reach of the investigation. In practical terms, this means that they remain within the California counties of Alameda, Contra Costa, and San Francisco. Their numbers will, of course, decrease each school year. After ten years, the number remaining of the original 338 is 220, a remarkably high retention figure. The aim is to retain as many as possible, with the expectation that one hundred or more of the original 338 subjects will still be available for study at the twelfth grade level.[1]

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[1] As a precaution against a decrease in the number of subjects, arrangements were made in 1955-56 with the public schools of Berkeley, an adjoining city, to record and study the language of 43 third graders the same age as the Oakland subjects. The samples of the oral and written language of the Berkeley subjects and other useful data about them have been filed, without analysis, for a three-year period. However, it has become obvious that a combination of persistence and good fortune has enabled the researcher and his staff to retain such a large number of the original subjects that this procedure is no longer necessary, and therefore it is no longer being followed.

THE SAMPLE

The 338 subjects used in this study were chosen to represent a stratified sample of a larger universe of children. Eleven kindergarten classes were matched with family backgrounds typical of the city of Oakland, California. Thus subjects included a range of family status from definitely poor economic circumstances in the industrial areas down by the Bay through the middle class areas up to the more favored socio-economic circumstances of the hill-top districts. The evidence on socio-economic status for the subjects in this research places the median at middle class.[1]

However, stratification was not tied to one particular variable such as socio-economic status. The choice of subjects also included representativeness on the bases of sex, racial background, and spread of intellectual ability. Care was taken to avoid any unique or unusual factor of selection. In other words, these four general stratification variables were used, together with proportional allocation. The characteristics used for defining the strata were related to the subject under investigation, inasmuch as other studies of children's language have identified socio-economic status, sex, race, and intelligence as factors influencing language proficiency.

Of the 338 subjects initially in this study, 156 were male and 182 were female in the age range of 5.0 to 5.9 years. The per cent of Caucasian (62.4%), Negro (32.0%), and Oriental (5.6%) approximates very closely the current per cent of these racial groups in Oakland (a city of about 384,575) although at the outset of the study the city itself had a larger percentage of Caucasian residents.[1] Measures of intelligence (Kuhlman-Anderson) for this same group (administered in second grade) reveal a mean of 102.5 and a σ of 9.18. Of the eleven classes, two had 26 pupils, two had 27, and one each had a class size of 28, 29, 31, 33, 36, 37, and 38. The sample provides clear evidence of representing the school population of Oakland. Oakland, in turn, is assumed to be typical of the urban center in twentieth century America: a population varying in religion, race, national background, and socio-economic conditions.

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[1] For these subjects the median score is IV, which is also the median of the Minnesota Occupational Scale. A more complete discussion of the subjects' socio-economic classification and of the Minnesota Occupational Scale will be dealt with presently.

No matter how carefully a research study is designed to represent a population, the quality of its field execution affects the adequacy of the sample. In this study all children in these eleven classes were used; no exclusions whatsoever were made. Each intact kindergarten group was considered a typical public school cluster, and care was taken to make sure that the clusters were not attenuated by conditions other than death or removal from the area.

THE DATA COLLECTED

In the present study evidence concerning the 338 subjects' use, development, and control of language was needed for each individual. Plans were carried out to collect data concerning (a) their vocabulary, (b) their use of oral and written language, (c) their proficiency in reading and listening, (d) teachers' judgments of their skill with language, and (e) background information on their health and homes. These data were collected over a period of ten years, from kindergarten through grade nine. (In the larger study, the collection continues until 1964-1965.)

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[1] As of grade seven, 230 subjects remained in the study, 106 male and 124 female. The seventh grade ethnic ratio is Caucasian 53.5%, Negro 39.1%, and Oriental 7.4%.

Each subject was interviewed individually and his spoken responses recorded annually on either a tape or a similar recording device (the Audograph). The Audograph reproduces sound on a plastic flexible disc and preserves a reliable reproduction of the subject's voice.[1] Each interview followed a standardized form and, in cases where an extra question was asked, the purpose was solely to encourage a flow of language already on its way. At the beginning of the interview, the examiner encouraged the subject to become talkative by asking him questions about playmates, games, television, illness, and wishes. Next the subject was shown, for the remainder of the interview, a series of six pictures, the same pictures being used for all subjects. The pictures were chosen for their interest, their success in preliminary trials, or their value in previous research. The subjects were asked to discuss what they saw in each picture and what each picture made them think about. The recorded interviews were then transcribed into typewritten form according to a careful set of directions. These transcripts of the child's oral language constitute some of the most important data collected in the study.

Additional data include measures of the subject's intelligence and evidence of achievement in vocabulary, use of relational words (such as however, consequently), and achievement in reading, writing, and listening.

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[1] Audographs do not reproduce the quality of voice with as much fidelity as do tape recorders, but the quality is certainly not poor. Beginning with the first grade, tape recordings as well as Audograph records were made for selected children whose linguistic behavior in the kindergarten year had proved to be particularly interesting or exceptional. As the years of study have progressed and funds have become available, the use of tapes has been increased and gradually has replaced the use of Audograph records.

In addition, for each school year, the teachers rated the subjects on selected language factors and kept accurate records of school attendance. Background information on homes, parental occupations, health, siblings, and date of birth completes the data.

TECHNIQUES

In the search for answers, many different kinds of method and analysis have been used in this research. These techniques have been classified into four groups:

- . . . new methods of analysis originated for the purposes of this investigation
- . . . methods of analysis derived from other research
- . . . standardized tests
- . . . ratings and indices for such factors as socio-economic status, school attendance, and writing ability.

The techniques in each of these groups will be described in the paragraphs which follow.

1. New Methods of Analysis

Segmenting the Subjects' Oral Language

In this research, devising an objective method for segmenting the flow of oral language was a critical problem. Certain familiar systems of dividing language into segments proved to be inadequate. Words alone, for instance, offer a crude basis for numerical count but show nothing about relations among words. Traditional grammatical divisions, such as sentences, also blur important distinctions and often do not correspond to the actuality of oral language where utterances may be only phrases or single words. The system of segmentation finally chosen was one which combined several approaches. First the subjects' speech was segmented by oral intonation patterns and then, within such intonation segments, syntactic units (each independent predication) were identified.[1]

> . . . The first of these--intonation pattern--is dependent upon the patterns of sound made by the human voice; it is judged by the contours of inflection, stress, and pause in the subjects' voices. Because the segmentation is made in accordance with the sound-system of English, this first and more comprehensive segment will be called a phonological unit.
>
> . . . The second unit, always a subdivision of the larger phonological unit, will be called a communication unit because it can be identified by the semantic meaning which is being communicated.
>
> . . . Beyond these two kinds of segmentation, a third element still remained to be accounted for, an exceptionally interesting and frequent occurrence that could best be described as a tangle of language which did not make semantic sense and was impossible to classify phonologically or semantically. These language tangles have, therefore, been segmented separately

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[1] This choice of segmentation is the outcome of a conference sponsored by the U.S. Department of Health, Education, and Welfare and held at Bloomington, Indiana, in October of 1959. The linguistic consultants at this conference were John Carroll, W. Nelson Francis, Fred Householder, David Reed, and Harold Whitehall. The conference established a conformity of method for the research being reported in this monograph and for that of Ruth Strickland, whose similar research into the language of children may now be consulted in The Language of Elementary School Children: Its Relationship to the Language of Reading Textbooks and the Quality of Reading of Selected Children. Bulletin of the School of Education, Indiana University, 38: 4 (July, 1962). Bloomington: Indiana University; 1962.

and have been labeled mazes. Each of these three segments will now be described more fully and illustrated by examples.

The phonological unit--An example will help to make clear what the phonological unit is in this study. One child in the study said the following words:

> I'm going to get a boy| 'cause he hit me.# I'm going to beat him up and kick him in his nose‖ and I'm going to get the girl, too.#

The silence pauses of the subject's speech, in association with his use of pitch, show two double-cross junctures (#). The double-cross is a mark to show a pause or juncture in speech which is a clear-cut termination to an utterance. It is usually marked by a definite pause preceded by a diminishing of force and a drop in the pitch of the voice (or a rise in pitch for queries). The other two marks--double-bar juncture (‖) and single-bar juncture (|)--represent silence pauses of less finality. In this example, the speaker used two definite phonological units, units characterized by definite pauses following a definite drop in pitch.[1] The phonological unit, then, is an utterance occurring between the silences represented by double-cross junctures. If the example given in this passage seems to show phonological units to be identical with traditional grammatical "sentences," the reader may be assured that the subjects in this study often did not let their voices drop and pause at the end of every traditional sentence. Moreover, the subjects sometimes answered questions in phonological units that were, grammatically, subordinate clauses.

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[1] For a more complete discussion of these terms, see W. Nelson Francis, The Structure of American English (New York: Ronald Press; 1958), p. 157, and Archibald A. Hill, Introduction to Linguistic Structures (New York: Harcourt, Brace & World; 1958), pp. 13-30.

The communication unit--The communication unit has been defined by Watts as a group of words which cannot be further divided without the loss of their essential meaning.[1] For instance, "I know a boy with red hair" is a unit of communication. If "with red hair" is omitted, the essential meaning of that particular unit of communication has been changed. "I know a boy" does not mean the same thing as "I know a boy with red hair." In all cases, the words comprising a communication unit are examples of grammatical independent predication or they are answers to questions which lack only the repetition of the question elements to satisfy the criterion of independent predication. On the other hand, "Yes" can be admitted as a unit of communication when it is an answer to a question such as "Have you ever been sick?" Thus, these units prove to be not exclusively semantic; they are also syntactic, being composed of independent predications; they can be identified by their form as well as by their meaning. Since "essential meaning" might be difficult to define scientifically, the formal definition of an independent clause between two silences becomes more defensible than the semantic (or meaning) definition.

The following examples illustrate quickly the method of tallying these communication units of language. A slant line (/) marks the completion of each communication unit. (The # marks the completion of a phonological unit.)

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[1] This is what A. F. Watts calls "the natural linguistic unit." See A. F. Watts, The Language and Mental Development of Children (Boston: D. C. Heath & Company; 1948), pp. 65-66.

Examples of Communication Units

Transcription of Subject's Actual Language	Communication Units	Number of Words in Each Communication Unit
I'm going to get a boy 'cause he hit me.#/ I'm going to beat him up an' kick him in his nose‖/ and I'm going to get the girl, too.#/	3	11 13 9

Note that the first communication unit could not be divided after "boy" without the disappearance of (1) its essential meaning and (2) a subordinate clause that is part of the independent predication. Note in the last two communication units that a compound predicate with the same subject is classified as one unit, but a compound sentence (which can be divided without essential loss of meanings) becomes two communication units. This distinction is of importance to this study and should be noted carefully by the reader. In actuality, the communication unit in this research proves to be the grammatical independent clause with any of its modifiers. No communication unit includes more than one such clause. Thus this second kind of segmentation can actually be achieved structurally, but the use of meaning does reinforce the method of segmentation adopted for this research. Some linguists have been critical of any use of "communication" or meaning, urging a rigorous use of structure alone. The writer, however, has seen no problem in using meaning as a double check on the structural methodology which is actually being used. By so doing, some mistakes have been located, no dilemmas have arisen, and the research has retained a closer alliance with the ultimate purpose of language.

The language maze--One cannot listen to these recordings or read the transcripts without noting how frequently the subjects, when they attempt to express themselves, become confused or tangled in words. This confusion occurs not only in interview situations but also in the daily talk of the children, in the classroom when they share experiences, and on the playground of the school. The language behavior in question is not a matter of words tumbling over one another but rather a case of many hesitations, false starts, and meaningless repetitions. In this research these language tangles have been labeled mazes. The linguistic troubles of the subjects resemble very much the physical behavior of a person looking for a way out of an actual spatial maze. He thrashes about in one direction or another until, finally, he either abandons his goal or locates a path leading where he wishes to go. Sometimes he stumbles upon a way out; sometimes he has presence of mind enough to pause and reason a way out.

These mazes are a series of words or initial parts of words which do not add up, either to meaningful communication or to structural units of communication as defined in this research. They are unattached fragments or a series of unattached fragments which do not constitute a communication unit and are not necessary to the communication unit.

Sometimes the mazes are very long, consisting of from ten to twenty or more fragments of words. Sometimes the subjects persevere with the ideas they are trying to formulate and, at the end of the maze, do achieve a unit of communication. Other times the subjects abandon the ideas they are trying to express, perhaps finding the problem too difficult or too tiring to express, or not worth the effort. It is entirely possible that in another situation, where the motivation was much greater, the same idea represented in the maze might find its way to a clear expression of meaning. The energy level or the health of the subject may also be decisive factors in the child's success or failure in converting an idea into a genuine unit of communication.

Examples of Mazes

(Mazes are in brackets. The number of words in the maze is circled.)[1]

Transcription of Subject's Actual Language	Communication Units	Number of Words in Each Communication Unit
1. (Short maze at the beginning of a communication unit and integrally related to that communication unit.) ["I'm goin'] . . . I'm goin' to build a flying saucer/ but I can't think how yet."#	2	③ - 8 7
2. (Short maze in the middle of a communication unit and integrally related to that communication unit.) "When I was fixin' ready to go home, my mother called me up in the house/ an' [an' an' have to] I have to get my hair combed."#	2	16 1- ④ - 7
3. (Long maze not immediately related to a communication unit. The child apparently drops the whole project as being too complicated for his powers.) "I saw a hunter program last Sunday/ [an' he, an' snow time he had to have lot uh, wah-h when he, uh, not too many dogs, he] . . . and that's all I think of that picture."#	2	7 ⑬ 9

Such mazes are not counted as communication units. The procedure has been to count the words in them, however, and then circle this count. The reader will note that when a maze is removed from a communication unit, the remaining material always constitutes a straightforward, acceptable communication unit. Furthermore, just as the communication units fall within phonological units, so too do the mazes fall within phonological units.

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[1] In the actual transcript, the analyst always brackets and encircles mazes with red pencil.

These three methods of analysis ([1] the phonological unit, [2] the communication unit, and [3] the maze) were applied to the transcripts of the subjects and have become the basis for what is called in this research the First Level of Analysis. The following rules summarize the method of segmentation used in this research:

1) Every utterance must contain at least one communication unit. Hence an utterance which is not an independent clause but which is preceded and followed by (terminal) silence on the part of the child is arbitrarily defined as a communication unit.

2) The material in a stretch between terminal silence and terminal silence contains at least as many communication units as it contains independent clauses. Every independent clause is a communication unit; no communication unit contains more than one independent clause.

3) In a stretch between terminal silences, material which precedes, separates, or follows independent clauses constitutes either mazes or further communication units. Every stretch of this material which constitutes an elliptical independent clause (such that it could be expanded into an independent clause by the simple repetition of words from the context) is a communication unit.

4) A word like yes or no is a separate communication unit when it could be replaced by an independent clause. It is not a separate unit when it could not be replaced by an independent clause but merely introduces such a clause.

First Level of Analysis--The communication units, constituting either phonological units or parts of phonological units, come close to being what are traditionally known as sentences. But to ignore the phonological method of segmentation would mean to disregard important clues. Thus, to the syntactic and meaning approaches to language, we have joined the phonological. The result proves to be one which makes *maximum use both of structure and of meaning*. Although communication units are not inevitably segmented by double-cross junctures, they are usually so marked. In instances where they are not, either a double-bar or a single-bar juncture does occur *without exception*. Thus assured of genuine segmentation, the research worker can next ask what to do with the segments.

In this research, the decision was to classify the communication units according to a system of basic structural patterns such as the following:

. . . Subject--Verb	George eats.
. . . Subject--Verb--Object	George eats onions.
. . . Subject--Linking Verb--Predicate Nominative	Onions are roots.
. . . Subject--Linking Verb--Predicate Adjective	Onions are good.
. . . Subject--Verb--Inner Object--Object	George gave John an onion.

Nine patterns, representing basic structures of the English sentence, were used. This First Level of Analysis, then, shows the frequency and variety of structural patterns used by the subjects. It will show whether or not children know these patterns before they come to school, merely elaborating them thereafter, or whether they learn to use some of these patterns after they have entered school. It will show whether some children use certain patterns more often than others. It will show whether or not the same patterns of structure are used for writing as for speaking, and it could be used to show whether or not the patterns occurring in children's readers correspond to the patterns children use in their speech.

Symbols Used in Analysis of Communication Units

To simplify the technique of analysis on this First Level, the following symbols were used:[1]

	2						Ξ								
1	②	3	4	5	6	M	△Z	X	U	+	✦	T	O	W	?

1 = subject
This includes both the head (central word) and its modifiers (articles, appositives, restrictive and nonrestrictive phrases and clauses).

Example: $\overset{1}{\boxed{\text{The fat robin with the sharp bill}}}$ was flying swiftly.

2 and ② = verbs used as predicates
This includes the head (the main verb) plus auxiliary verbs and modifiers.

Example: The fat robin $\overset{2}{\boxed{\text{was flying swiftly.}}}$

2 represents transitive and intransitive verbs.

Examples: The robin $\overset{2}{\boxed{\text{eats.}}}$.

The robin $\overset{2}{\boxed{\text{eats}}}$ worms.

② represents linking verbs.

Examples: The bird $\overset{\textcircled{2}}{\boxed{\text{is}}}$ a robin.

The bird $\overset{\textcircled{2}}{\boxed{\text{is}}}$ red.

The music $\overset{\textcircled{2}}{\boxed{\text{sounded}}}$ loud.

3 = the inner complement (indirect object)

Example: She gave $\overset{3}{\boxed{\text{the boy}}}$ some bread.

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[1] This formula was devised for the research of both Strickland and Loban at the Bloomington conference previously mentioned. The use of numbers is solely a convenience, saving time in tallying and coding. Otherwise, a system such as N, V, LV might be just as useful.

4 = the transitive verb complement (direct object)

Example: The machine crushed $\overset{4}{\boxed{\text{the rock.}}}$

5 = the linking verb complement (adjectival, nominal, or other element used as subjective complement)

Examples: The bird is a $\overset{5}{\boxed{\text{robin.}}}$

The bird is $\overset{5}{\boxed{\text{red.}}}$

The time is $\overset{5}{\boxed{\text{now.}}}$

She seems $\overset{5}{\boxed{\text{happy.}}}$

6 = the outer (objective) complement

Examples: We elected him $\overset{6}{\boxed{\text{president.}}}$

She painted her house $\overset{6}{\boxed{\text{purple.}}}$

We found her $\overset{6}{\boxed{\text{alone.}}}$

We found her $\overset{6}{\boxed{\text{in tears.}}}$

M = the movable parts of a sentence (words, phrases, or clauses with no fixed position. However, the degree of "movability" varies. Some elements prove to be more movable than others.)

Examples: Boys $\overset{M}{\boxed{\text{usually}}}$ like dogs better than cats.

$\overset{M}{\boxed{\text{The rain having stopped,}}}$ they went home.

Z = a maze

Example: [. . . an' he, an' snow time he had to have lot uh, wah-h when he, uh, not too many dogs, he . . .]

Z⃤ = a false start, a shift in expression, but not the confusion of a maze

Example: I was going to buy $\overset{Z⃤}{\boxed{\text{three little . . . no,}}}$ four big bars.

X = words of little meaning value used as primers or launchers (well, see, you know, let's see, yeah) or as fillers (or something, and so forth)

U = short utterance, a word or group carrying meaning, with a falling intonation (Yes, O.K., I think so)

+ = a sentence connector (and, but, so, and so)

ǂ = subordinators, subordinators used as connectors (until, since, if, although, because, etc.)

T = topic followed by subject

Example: $\overset{\text{T}}{\boxed{\text{The man in the picture,}}}$ well, he is thinking about his pal.

O = ellipsis of an essential part of the sentence

W = question words (who, when, why, what, where, how)

? = unanalyzable construction (This is not a maze but a construction about which the analyst cannot be certain: these occur with extreme rarity, for almost always the combination of phonological, syntactic, and semantic evidence dispels the need for a ?)

Patterns of Communication Units

Applying these symbols to the communication units then became the next step. Each communication unit, it will be remembered, is a syntactic unit verified by two methods--the fact that phonologically it is separated from the surrounding language by an intonation juncture and the fact that grammatically it is or contains an independent predication which communicates meaning. Analysis shows that all communication units, once any mazes have been cleared away, may be classified under the following nine patterns and one partial or incomplete unit:

Pattern	Symbol	Examples
one	1 2 or 1 ②	Mary eats. (or) Mary is home.
two	1 2 4	Mary eats strawberries.
three	1 ② 5	Strawberries are berries. Strawberries are good.
four	1 2 3 4	Mary threw the dog some biscuits.
five	1 2 4 6	They elected Mary president. They thought Susie conceited.
six	(1) ② 1	Here is Mary. There are four houses on Lime Street.
seven	Questions	How does he do it? Is he here?
eight	Passive forms	Strawberries were eaten by Mary.
nine	Requests, commands	Go home. (or) Let us go home.
(ten)	Partials	Any incomplete unit (This is not actually a pattern like the preceding nine patterns.)

Second Level of Analysis--The Second Level of Analysis is a deeper analysis of the elements comprising the First Level of Analysis. The First Level provides a skeleton picture of communication units which may then be examined for patterns of structure, a matter of genuine importance in linguistic study, whereas the Second Level examines the component parts of the pattern displayed at the First Level. Do some children use more subordinate clauses than others? Which children use only single words for subjects, objects, or complements, and which ones use more complicated nominals, infinitives, clauses, and verbal phrases? From the First Level of Analysis any element in the formula--the M's (movables), the 1's (subjects), the Z's, or any other element--may be chosen for more complete analysis on the Second Level. For instance, what repertoire of movables does a child produce? Does he use single words only or elaborate clusters of phrases and clauses? What does a study of his verbs reveal? The possibilities of fruitful analysis at the Second Level are numerous.

Function of Communication Units

Another tool of analysis is the classification of the subjects' speech in terms of function. This method--requiring great amounts of time to carry out--was used only with the two special groups included in the design of this study--the subjects designated as high and low in language skill.

In any study of language, it is desirable to consider not only quantitative aspects such as units and mazes but also qualitative aspects such as the uses to which language is put. Other research workers have classified the functions of children's speech into various categories, categories determined by the conditions under which the samples were taken. For instance, Piaget divided the functions of children's playground speech into categories of egocentric and socialized speech.[1] Rugg and others chose classifications such as self-assertion, perceptions, and linguistic experimentation.[2] The content of communication varies so greatly with the situation in which it occurs that no universal set of function-classifications has emerged from research. Categories devised for studying the functions of language will always depend on the purposes of the investigation and the situation from which the language sample is drawn. In this present research, the subjects' transcripts were studied to determine categories actually occurring in the situation from which the subjects' language was recorded. The most useful and suitable categories proved to be seven kinds of expressions:

1) facts and unelaborated perceptions

2) interpretations

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[1] Jean Piaget, The Language and Thought of the Child (New York: Harcourt, Brace, & World; 1926).

[2] H. Rugg, L. Krueger, and A. Sondergaard, "Studies in Child Personality: I. A Study of the Language of Kindergarten Children," Journal of Educational Psychology, 20 (1929), pp. 1-18.

3) personal associations
4) tentative statements or suppositions
5) generalizations
6) irrelevancies
7) direct questions
8) figurative language

It is worth noting that in a different situation, the categories used here might not be fully comprehensive. The functions of language shift from situation to situation. Classification in this research was not intended as a contribution to the study of function; instead, it was part of the search for techniques which might reveal differences between subjects high and low in language ability.

Classification of Oral Language Style

A third method of analysis created for this research was based on style rather than content. In oral language, each individual uses a distinctive style or manner of speaking, one closely related to his personality. People speak impulsively or deliberately, fluently or hesitantly, loquaciously or laconically. The outstanding features of spoken linguistic style have been known for centuries; thus it is possible for an analyst to describe such features and to focus upon one feature at a time in a situation where the recordings could be played and replayed as many times as necessary.

In this study, even in the kindergarten year, the subjects expressed themselves in highly varied styles of speech. Eleven outstanding features of spoken style were identified, each one being stated as follows in the form of a continuum scaled 1 to 3:

fluent	to	halting
deliberate	to	impulsive
coherent	to	incoherent, disorganized
energetic	to	listless, weak, tired
laconic	to	loquacious
expressive	to	flat, expressionless
mature	to	babyish
distinct, clearly articulated	to	blurred, indistinct, mumbled
conventional in usage	to	unconventional in usage
ready in response	to	slow in response
relaxed	to	tense, strained

2. Methods of Analysis Derived from Other Research.

Four types of analysis applied to the data represent procedures already used by previous research workers. These four procedures are the (1) amount of subordination; (2) classification of conventional usage, syntax, and grammar; (3) classification of vocabulary according to frequency of use in the language; and (4) classification of vocabulary according to diversity. Each of these procedures is described in the paragraphs which follow.

Amount of Subordination

Both logical analysis and previous studies of language designate subordination as a more mature and difficult form of language expression than simple parallel statements connected by *and* or *but*.[1] Phrases and dependent clauses are verbal means of showing relationships; through them, speakers communicate more complex propositions than are possible with simple independent clauses. Furthermore, subordination makes possible a more coherent organization of related statements.

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[1] M. V. Bear, "Children's Growth in the Use of Written Language," *Elementary English Review*, 16 (1939), pp. 312-319. F. K. Heider and G. M. Heider, "A Comparison of Sentence Structure of Deaf and Hearing Children," *Psychological Monographs*, 52: 1 (1940), pp. 42-103. Lou LaBrant, "A Study of Certain Language Developments of Children in Grades 4-12 Inclusive," *Genetic Psychology Monographs*, 14: 4 (1933), pp. 387-394.

In this study, the incidence of subordination was tallied for the subjects who were exceptionally high or low in language ability and for a grou of subjects chosen at random from the total sample. All subordinate clauses, both for speaking and for writing, were counted and classified according to order of subordination (first-order, second-order, etc.).[1]

The ability to express natural or logical relations does not, however, depend solely upon subordinate clauses. Prepositional phrases, infinitives appositives, verbals, and other strategies of structure serve the proficien speaker or writer in expressing and compressing his thought. Therefore, th index of subordination, valuable though it has proved to be in revealing a degree of proficiency for subjects in this research, is nevertheless incomplete. A perfect index of structural complexity would encompass more than subordination.

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[1] A subordinate clause which modifies an independent element of the com munication unit is termed "first-order subordination." Subordination which modifies another subordinate element, which in turn modifies an independent element, is called "second-order subordination." Second-order subordinatio as well as all subordination, has been established in research as the mark of mature mental activity and complex expression. (See Lou LaBrant, "A Stu of Certain Language Developments of Children in Grades 4-12 Inclusive," Genetic Psychology Monographs, 14:4 (1933), pp. 387-394.) A few subjects i the present research even use third-order subordination.

A technique for studying such complexity is emerging from the current theoretical work of the American linguist, Noam Chomsky.[1] His transformation analysis is time-consuming, but it has been applied to the transcripts of two subjects in this research and shows great promise as a technique for studying children's language. The results show every indication of being a more complete and incisive extension of the subordination index used by LaBrant and by the present research. Future research in language will undoubtedly develop and use to advantage Chomsky's transformational analysis.

For our purposes here we will follow Chomsky in viewing our grammar as a system of devices which reinforce each other in generating and controlling grammatical utterances.[2] A knowledge of one's grammar will not, it must be pointed out, guarantee the consistent creation of grammatical sentences. Everyone who speaks English works from some kind of grammar, yet consciousness of the model is rare indeed, for as will be noted in this research, the child knows the structure of his language fairly well by the time he is in kindergarten. Nor does it follow that all models are equal in their power to generate accuracy.

Our grammar may be seen as existing and operating on two contiguous levels: (1) a phrase structure grammar and (2) a transformational grammar.

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[1] Noam Chomsky, "Review of B. F. Skinner, Verbal Behavior," Language, 35 (1959), pp. 26-58.

________, Syntactic Structures ('s-Gravenhage: Mouton and Company; 1957).

________, "A Transformational Approach to Syntax,: Third Texas Conference on Problems of Linguistic Analysis in English, May 9-12, 1958, ed. Archibald A. Hill (Austin: University of Texas Press; 1962).

[2] The technique of transformational grammar is described by Noam Chomsky in his book Syntactic Structures ('s-Gravenhage: Mouton and Company; 1957). The following description of transformational analysis and application to the language of two subjects in this research has been prepared by John Dennis, Assistant Professor of Language Arts, San Francisco State College, San Francisco, California.

The phrase structure grammar makes possible the simple, active *kernel statements* of our language--statements such as *John eats*, *John eats onions*, and *Onions are roots*. Within any kernel statement there are certain obligations and options. For example, a grammatical obligation in English is *concord* (or agreement) between subject and verb in active voice. The *s* on *eats* in *John eats onions* is an obligation. An option, on the other hand, is the use of a general or specific determiner or no determiner at all. Thus,

$$\left.\begin{matrix}\text{A}\\ \text{The}\end{matrix}\right\}\text{ boy eats }\left\{\begin{matrix}\text{the}\\ \text{a}\end{matrix}\right\}\text{onion.}$$

If the nominal phrase (or "complete subject") is singular or plural, the verbal phrase (or "complete predicate") is obliged to agree in person and number. On the other hand, the use of *a* or *the* is optional here. Inclusion or exclusion of modification constitutes another option in phrase structure grammar. However, it must be noted that the selection of certain types of modification can impose structural obligations.

We may think of the generation of an utterance in phrase structure grammar as a series of steps, governed by a small body of rules which tell us what order the steps should take and what options and obligations we have as we proceed. Such a model would look this way:

Step 1. $\text{NP}_{\text{singular}} + \text{VP}_{\text{singular}}$

Step 2. The N V NP

Step 3. The boy V a N

Step 4. The boy (C) eat a strawberry

Step 5. The boy (present) eat a strawberry

Step 6. The boy eats a strawberry

Step 7. Pattern of communication unit: / 1 2 4 /

Key

N = noun
V = verb
P = phrase
C = concord, tense

Each step represents one possible choice from among many which are implicit in the previous step. Each choice sets up obligations as we proceed.

If we look now beyond the level of kernel structures, those simple active statements in our language such as the / 1 2 4 / communication unit just above, we observe more than the manipulation of those kernel structures according to options and obligations. At this higher level, the much more complex structures of our language are produced by a succession of transformations. Examples of such grammatical operations beyond phrase structure grammar include passive constructions, auxiliary transformations, questions, negative constructions, emphatic constructions (using Do and Did plus primary stress), and the use of generalized conjunction transformations (the use of and to link sentence elements of the same type). Again there is an order which must be observed. If an active, positive statement is to be transformed into a passive, negative one, the passive transformation must precede the negative one. Our earlier structure "The boy eats an onion" would be transformed through these steps:

Phrase structure: The boy eats an onion.

Transformation: (passive) An onion (past) be + en eat by the boy.

Transformation: (auxiliary) An onion be (past) eat + en by the boy.

Transformation: (negative) An onion not be (past) eat + en by the boy.

An onion was not eaten by the boy.

It could be argued that there is nothing "new" about this kind of operation. Grammarians have been writing about passive constructions and the use of negatives for a long time. The coining and the use of the term *transformation* itself does not bring enlightenment. However, one advantage of transformation theory and classification may be noted: through a model, what was previously explained in impressionistic or imprecise terms can now be made more orderly, explicit, and economical.

Difficulties with Conventional Usage and Grammar

For a classification of nonstandard usage, syntax, and grammar, the investigator examined the categories established by Charters[1] and O'Rourke.[2] Modifications were necessary, for those earlier studies were based upon written language, and in this research the analysis of conventions is based on both written and spoken language. Consequently punctuation, spelling, and capitalization categories were omitted.[3] Thus the unconventional categories tallied for all subjects in the study were as follows:

1A: Agreement of subject and verb in the third person singular (excluding all forms of the verb *to be*).

1B: Agreement of subject and verb for all forms except the third person singular (again excluding all forms of the verb *to be*).

1B: Agreement of subject and verb using only forms of the verb *to be*.

1C: All verb problems concerned with consistency in the use of tense.

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[1] W. W. Charters, "Minimum Essentials in Elementary Language and Grammar, A Second Report." *16th Yearbook of the National Society for the Study of Education, Pt. I* (Chicago: NSSE; 1917).

[2] L. J. O'Rourke, *Rebuilding the English Curriculum: A Report of a Nationwide Study of English* (Washington: The Psychological Institute; 1934).

[3] The writing of the subjects has been collected each year.

1D: Omission of auxiliary verbs.

1E: Nonstandard verb forms.

2A: Nonstandard or confusing use of pronouns.

2B: Use of that instead of who as a relative pronoun referring to persons.

3A: Ambiguous placement of a word, phrase, or clause.

3B: Awkward arrangement, incoherence, or critical omissions (for example of both subject and predicate).

4A: Careless omission (except auxiliary verbs).

4B: Unnecessary repetition.

5A: Nonstandard use of prepositions.

5B: Nonstandard use of conjunctions.

6A: Nonstandard use of adjectives.

6B: Nonstandard use of adverbs.

7: Nonstandard noun forms.

8: Double negatives and possessives.

This analysis of usage, grammar, and syntax was carried out for all pupils in this study and for each year. A detailed statistical analysis has been carried out for three special subgroups designated as High Caucasian, Low Caucasian, and Low Negro. The method of selection and the results will be described at a later point in this monograph.

Vocabulary Measured by Diversity

For this purpose the research uses the type-token ratio, the number of different words used in relation to the total number of words. Although the type-token ratio has sometimes been criticized, it can disclose important distinctions when the size of language samples is kept uniform. The type-token ratio (TTR) is the ratio of the number of different words (types) to the total number of words (tokens) in a sample of language. Johnson[1] and Chotlos[2] have used this ratio as a measure of verbal diversification, showing that a writer or speaker who uses a large vocabulary has a more diversified style than one who uses a small vocabulary.

One difficulty with the TTR is that it necessarily becomes smaller as the size of the language sample becomes larger. For instance, in the present research, the TTR could have discriminated against subjects who used the most language because as the length of a sample increases, the possibility that words will be repeated becomes greater than the likelihood that new words will occur. In order to control this factor, the investigator divided all transcripts of the subjects' oral language into segments of 100 words and in each segment counted only the new words that had not appeared before in any preceding segment. From these counts bar graphs were constructed, plotting the number of new words per segment. These bar graphs show directly the degree to which members of both special subgroups introduced new words into the language samples.

Vocabulary Measured by Word Frequencies

Two measures of vocabulary power were based upon methods used in previous research. By using the count of word frequency by Thorndike and Lorge, the investigator was able to tally the subjects' words according to frequency of occurrence in the English language.[1] What per cent of a speaker's words occur in the 500 most commonly used words? What per cent occur in subsequent thousands as presented in Thorndike's count of word frequency? How does the vocabulary of subjects in the high special group compare with that of the subjects in the low special group? Considerations of time and cost limited this count to the two special subgroups high and low in language power.

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[1] Wendell Johnson, "Studies in Language Behavior: I. A Program of Research," Psychological Monographs, 56: 2 (1944).

[2] J. W. Chotlos, "Studies in Language Behavior: IV. A Statistical and Comparative Analysis of Individual Written Language Samples," Psychological Monographs, 56 (1944), pp. 75-111.

3. Tests

The tests administered to the subjects included reading tests; the Kuhlmann-Anderson Intelligence Test; and a test of ability to use subordinating connectors such as although, because, unless, etc.

Vocabulary

The vocabulary test of one hundred items was administered orally and individually to each subject during the kindergarten year. This vocabulary test was adapted from one devised by A. F. Watts, British research worker. British items such as teahouse were changed to restaurant or cafe. All items on the vocabulary test were questions which Watts asserts an average child of the age of eight and one-half should know. Typical questions are those in which the questioner asks, "What am I touching?" as he places his finger on his nose, eyebrows, or elbow. The British version is included in Watts' book, The Language and Mental Development of Children.[2]

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[1] E. L. Thorndike and I. Lorge, The Teacher's Word Book of 30,000 Words (New York: Teachers College, Columbia University, Bureau of Publications; 1944).

[2] Watts, op. cit., pp. 280-283.

Intelligence

In the second grade of the Oakland primary schools, the Kuhlmann-Anderson Intelligence Test is administered to all pupils. Where a discrepancy appears between a pupil's score and the teacher's observations of the pupil's intellectual performance in class, further testing is carried out with another form of the same test or the individual Stanford-Binet Scale. Intelligence tests are also repeated in later grades. All these scores were available for the subjects in this study. Subjects who had moved to nearby school districts by this time were also tested with the same tests.

Use of Subordinators

Watts has devised a test calling for the completion of unfinished sentences broken off at the point where a subordinating connector has just been introduced.[1] The correct completion has to be selected from among four phrases offered as possibles. An example follows:

I shall not be able to do my arithmetic unless

a) my exercise book is full.
b) you help me.
c) multiplication is very hard.
d) I forget my tables.

Beginning with grade five, this test was administered yearly to all subjects in the present research.

4. Ratings and Indices

In addition to the techniques and tests already described, five important ratings or indices were procured for all subjects in the study. These indices quantified teachers' estimates of the subjects' language ability, writing ability, socio-economic status, health, and school attendance.

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[1] Watts, *op. cit.*, pp. 302-305.

Teachers' Ratings of Subjects

For each year of the study, the teachers of the subjects rated them on selected language factors: (1) amount of language; (2) quality of vocabulary; (3) skill in communication; (4) organization, purpose, and control of language; (5) wealth of ideas; and (6) quality of listening. Inasmuch as this scale, along with the vocabulary test, comprised the basis on which the investigator selected the high and low groups representing the extremes of language ability, the scale merits particular mention. The reader's attention is directed to the fact that for each subject ten of these rating scales were available, one from each of ten teachers.

Index of Writing Ability

Beginning with the third grade, a sample of the subjects' writing was taken annually under standard conditions for all. A picture, somewhat complicated as to content, was shown to all subjects; they were permitted to write until they gave obvious evidence of having exhausted their fund of writing energy for this particular picture.

Two judges, both teachers of writing, were directed to classify the samples of writing into five categories as follows:

> Read each sample a number of times to gain a genuine impression, to note and weigh elements in relation to each other, and to assign a single Arabic numeral from 1 to 10 in accordance with this guide.
>
> Papers need not exemplify every item listed for each of the five categories. The items are not intended to weigh equally. You should vary their potential in relation to their combination with other elements. Those items with an (*) are perhaps the most crucial.

I **SUPERIOR** -- 10,9

*... Has a clear thesis statement, and the composition supports this statement.
*... Has a consistent and appropriate point of view.
*... Organizes his ideas; a definite plan is apparent.
*... Achieves clarity of content.
*... Has proportion, development, and completeness.
*... Uses well-constructed sentences--clear, idiomatic, and typical of accepted usage.
*... Uses relational (transitional) words (yet, however, since, etc.), to bridge the parts of his writing.
... Employs a variety of sentence arrangements.
... Uses a variety of phrases and clauses, moving them about to achieve greater effectiveness.
... Gives a setting, often indicating time and place.
... Includes a title which indicates the unity of the content.
... Employs vigorous verbs.
... Employs a vivid, picture-evoking vocabulary, specific rather than general (precise words).
... Displays imaginative or creative power through some method such as figurative language, irony, notable style, or unusual interpretation that is not irrational.
... Uses conventional spelling and punctuation.

II **HIGH AVERAGE** -- 8,7

*... Begins to organize, but the basis of organization is not firm enough to control the material completely.
*... Uses a few relational words, but not enough to give smoothness.
*... Tends to generalities rather than specificity.
*... Gives obvious rather than fresh or original interpretation.
... Uses limited sentence variety.
... Displays ordinary vocabulary.
... Uses reasonably appropriate spelling and punctuation.

III **LOW AVERAGE** -- 6,5

*... Makes little or no attempt to organize or shows inadequate awareness of his basis for organization.
... Uses no relational words.
... Employs weak or faulty sentence structure, indicating lack of understanding of sentence construction.
... Employs a limited vocabulary.
... Tends to be fragmentary, or, in longer writing, disjointed or formless.
... Gives no interpretation or at best an unrelated or weak one; interprets only the obvious, barely achieving interpretation.
... Uses poor spelling and faulty punctuation.

IV MARGINAL -- 4, 3

... Achieves chiefly incomplete, incoherent, or meaningless expressions.
... Employs occasional groups of related words.
... Fails to complete some words.
... Uses lists of words related to the subject.
... Uses barely comprehensible spelling.

V ILLITERATE -- 2, 1

... Resorts to pictures or drawings.
... Uses meaningless symbols or tangles of letters.
... Lists words either unrelated or only partially related to the subject.

If you (the two judges) differ by one ROMAN numeral, in your judging, the research director should read and score the paper. The final score should represent the agreement of two out of three who have read the paper.

The classification assigned to the subjects' writing was then used for a study of its relation to achievement in reading, oral language, and other measures of the subjects' use of language.

School Attendance

Because the financing of education in California is based upon average daily attendance in school districts, strict records of attendance are kept in all schools. For each subject in the study it was possible to locate an exact record of the number of days present in school and to relate this index of school attendance to such matters as reading, writing, and speaking ability.

Socio-economic Status

The occupation of both parents (or of legal guardians) was determined for all subjects and classified according to the Minnesota Scale for Paternal Occupations.[1] This Scale was developed at the Institute of Child Welfare, University of Minnesota, as a basis for classifying persons into socio-economic groups at a time when the Institute was looking for an instrument which would enable it to secure a cross section of the population. The Taussig classification, the Barr scale, and the U.S. Census classifications were used in the development of this scale, which places occupations in seven categories. In using levels of occupation, the Minnesota Scale differs from the U.S. Census classification. The latter uses types of service (for example, a physician and his assistants are all listed under professional service in the Census classification, whereas in the Minnesota Scale, these occupations are distributed over several classes). In 1930 and 1940 classifications of the U.S. Census data were checked in terms of the categories of the Minnesota Scale. While there had been some shifts, the population remained relatively stable in occupational distribution. Table 1a shows the relative distribution of the population for these various samples in which the Minnesota Scale has been used.[2] As can be seen in Table 1a, the present study contains a greater percentage of those occupations classified as professional and semi-professional and a correspondingly lower percentage of the other occupations in the Minnesota Scale. This is partially a result of a general upgrading of socio-economic status for the country as a whole and partially a result of using a large urban community (Oakland, California) from which to select subjects. Table 1b shows a more complete socio-economic breakdown of the subjects as of grade seven. From this table it can be seen that minority groups, particularly the Negro, account for the bulk of the lower socio-economic percentages.

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[1] Minnesota Scale for Paternal Occupations. Institute of Child Welfare, University of Minnesota, Minneapolis University Press; n.d.

[2] In the present study, two judges carried out the socio-economic ratings, using as guides the Alphabetical Occupational List for Classification of Occupations furnished with the Minnesota Occupational Scale and the Dictionary of Occupational Titles. (Dictionary of Occupational Titles. Prepared by the job analysis and information section, division of standards and research, U.S. Department of Labor. Washington: Superintendent of Public Documents; 1939). To check on the reliability of the two judges' ratings, one with the other, seventy subjects were chosen by Fisher and Yates' Table of Random Numbers and a comparison made. Sixty-four cases were ranked the same and six cases differed by one point.

TABLE 1a

FOUR SAMPLE POPULATIONS USING THE SEVEN CATEGORIES OF THE MINNESOTA OCCUPATIONAL SCALE OVER A PERIOD OF TWENTY-FIVE YEARS

(in per cent)

Socio-economic Status		Goodenough and Anderson[a] 1930	Hansen[b] 1940	Loban[c] 1948	This Study 1953-56
I	Professional	3	3	3	11
II	Semi-professional	5	7	9	19
III	Clerical, Skilled Trades, Retail Business	14	14	17	12
IV	Farmers	19	15	13	11*
V	Semi-skilled Occupations	27	24	36	21
VI	Slightly Skilled Trades	13	15	18	18
VII	Day-laborers	19	22	4	8
	Total	100.0	100.0	100.0	100.0

[a] _Minnesota Scale for Paternal Occupations_, Institute of Child Welfare, University of Minnesota, Minneapolis, University of Minnesota Press; n.d.

[b] _Ibid_.

[c] Walter Loban, "A Study of Social Sensitivity (Sympathy) among Adolescents," _Journal of Educational Psychology_. Vol. 44, No. 2, February 1953, pp. 102-112. This sample included 376 cases in midwestern communities.

*The present study is an all-urban sample. However, on some occasions one parent will have a socio-economic status of III whereas the other has a rating of V. The result will thus be IV when the ratings are combined.

TABLE 1b

SOCIO-ECONOMIC STATUS BY ETHNIC GROUP

Total Group of Subjects in Grade Seven

N = 230

Socio-economic Status	Total		Caucasian		Negro		Oriental	
	N	%	N	%	N	%	N	%
I	26	11.30	26	11.30	0	0.00	0	0.00
II	37	16.09	33	14.35	3	1.30	1	0.43
III	36	15.65	29	12.62	6	2.61	1	0.43
IV	22	9.57	10	4.35	10	4.35	2	0.88
V	47	20.43	15	6.52	21	9.13	11	4.79
VI	43	18.70	9	3.91	33	14.35	1	0.43
VII	19	8.26	1	0.43	17	7.39	1	0.43
Total	230	100.00	123	53.48	90	39.13	17	7.39

Energy and Health

The Oakland public schools maintain an extensive program of physical examinations and preventive medicine. A special blue cumulative card, devoted solely to physical and mental health, records the observations of physicians, school nurses, teachers, and special home visiting teachers. For all subjects in this research, data concerning health were collected for the research files. For the special groups (those of low and high ability), these cards were scrutinized and further inquiry was made in cases where any doubt existed concerning the data. In addition, in the recorded interview all subjects were asked each year to describe any illnesses or poor health they had experienced.

VALIDITY AND RELIABILITY

As in all studies, basic questions must be asked: Do these techniques and procedures accurately measure what they are intended to measure? How much error is present in measures purporting to reflect the phenomena under examination? How consistent are these measures if applied several times? Even when samples are truly representative of the total population, these problems of validity and reliability require attention.

All judgments and classification in this research have been made by two or more competent workers with background for the job and special training for the particular task. For each of these tasks explicit coding directions have been prepared and used. The reliability of all such judgments has been checked by the formula Lewin and his colleagues first used in their comparison of the Boy Scouts of America with the Hitler Youth Movement.[1] This formula can be varied for three or more judges:

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[1] Herbert S. Lewin in Human Relations, Vol. I, No. 2, 1947, p. 206 ff.

$$\frac{2 \times \text{the sum of agreements}}{\text{sum of the items checked by both judges}}$$

Repetitions of the same situation offer one kind of reliability measure. In the first year of this study, 15 subjects were interviewed twice by two different interviewers. These transcripts, along with seven more accumulated during the primary school years, provided an opportunity to determine reliability for such matters as length of response, vocabulary count by Thorndike's word frequency count, number of communication units and mazes, classification of linguistic style, and function of communication units.

The basis on which special groups have been selected provides a further test of validity of measures. Since there are numerous significant differences in means for the two groups and these significant differences fall logically and consistently in the same direction as the selection of the groups, such coincidence of logical and statistical evidence offers additional assurance of validity for those aspects of the study.

Supplementary validation can be examined for a number of factors in this study. Supplementary validation is possible, for instance, with the four measures of vocabulary: the teachers' ratings, the Watts' vocabulary test, the Thorndike word frequency count, and the type-token ratio. In the classification of a subject's linguistic style, qualities such as hesitancy and faltering bear a logical relation to the number of mazes counted on his typed transcript. On the language rating scale used by the teachers one item is devoted to amount of language, regardless of quality, and these ratings can be compared with the total number of words the subjects use in the ten annual interviews (grades kindergarten through nine) as well as the scores on the loquacity scale for linguistic style.

From previous research, we may expect language development to show a consistent relation to socio-economic status.[1] In this research the results on such matters parallel other research. Previous research has also established subordination as a measure of more complexity in linguistic expression and of more mature mental activity. Thus, the positive relation found between intelligence quotients for the subjects in this study and the subordination count constitutes further validation.

If some subjects remain in the same relative positions with respect to the rest of the subjects from year to year, some evidence on reliability will be established and even more important, evidence on the possibility of prediction will be produced. Whether or not all or any of these checks on validity and reliability are favorable to this research will appear in the statistical results. The next section of this monograph will present those findings.

SUMMARY

The plans and arrangements for a longitudinal study of a representative sample of subjects have been described. In addition to the complete sample of 338 kindergarten pupils, two special subgroups were identified for intensive study: a group exceptionally high in language ability and a group exceptionally low in language ability. These two groups were selected on the basis of a ten-year average of oral language ratings (teacher's ratings). This criterion--teacher's ratings--was chosen in lieu of any other established standards of proficiency with language. One purpose of this research is to locate such standards through empirical evidence.

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[1] See Dorothea McCarthy, "Child Development: Language," in Walter S. Monroe, ed., Encyclopedia of Educational Research, rev. ed. New York: Macmillan Company; 1950, p. 170.

The techniques and procedures by which the data were collected and analyzed have been presented under four headings: new methods of analysis; methods based on previous research; tests; and ratings or indices.

In the next section, the findings, resulting from the application of these procedures and techniques, are presented under headings related to the purposes of this research.

CHAPTER TWO

FINDINGS

The previous chapter has described the research design and the procedures for gathering and analyzing evidence on children's developing use and control of language. The present chapter deals with the results of those procedures. The evidence on fluency will be presented first; next in order will follow the findings on effectiveness and control of language, the functions accomplished by the subjects' use of language, and the interrelations among the various aspects of language.

FLUENCY

Readiness and smoothness of speech are part of proficiency with oral language. A parallel fluency appears in the writing of such men as Shelley or Churchill, poets and statesmen whose written and oral language excels that of the average person. Obviously fluency with words unaccompanied by organization or coherence can be a vice rather than a virtue, but the ability to find words with which to express oneself--and to find them readily--is normally one mark of success with language. The initial examination of the data in this study, therefore, will examine the subjects' fluency.

The findings on fluency are drawn from four sources: (1) the amount of language uttered by all subjects; (2) the subjects' freedom from mazes; (3) the extent of their vocabularies; and (4) their manner of speaking as quantified by two classifications of linguistic style, the ratings for fluency-hesitancy and for readiness-slowness of response.

For sheer amount of language--regardless of its quality or coherence--transcripts of the children's interviews in the ten-year period show a range from a total of two words[1] to one total of 4,244 words. Tables 2a, 2b, and 2c, dealing respectively with the total group, the high group, and the low group, show the means and measures of variability for words, communication units, and mazes. The data are also presented graphically in Figures 1a through 1g.

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[1] A kindergarten subject whose parents spoke only Chinese.

TABLE 2a

AMOUNT OF LANGUAGE: TOTAL GROUP OF SUBJECTS
MEASURES OF CENTRAL TENDENCY AND VARIABILITY FOR WORDS, COMMUNICATION UNITS, AND MAZES

Grades Kindergarten through Nine

Grade	Total Number of Words in Transcript		Total Number of Communication Units in Transcript		Total Number of Words in Communication Units		Average Number of Words per Communication Unit		Total Number of Mazes in Transcript		Total Number of Words in Mazes		Average Number of Words per Maze	
	Mean	σ	Mean	σ	Mean	σ	Mean	σ	Mean	σ	Mean	σ	Mean	σ
Kindergarten (N=338)	555.48	478.00	99.74	28.07	487.13	391.22	4.81	1.33	25.31	21.42	68.35	67.24	2.58	0.97
One (N=260)	618.66	314.62	92.00	30.33	557.00	260.43	6.05	1.37	23.15	16.97	61.66	54.19	2.48	0.92
Two (N=261)	581.00	295.87	103.50	55.00	529.40	263.34	6.57	1.18	20.60	15.23	51.60	32.53	2.39	0.92
Three (N=259)	778.40	383.31	109.80	37.74	730.50	342.75	6.65	1.81	20.50	16.21	47.90	40.56	2.45	1.34
Four (N=246)	945.15	489.80	111.14	48.27	877.95	452.65	7.70	1.26	31.49	21.22	67.20	51.66	2.05	0.44
Five (N=243)	1331.51	671.64	153.62	67.91	1232.87	615.31	7.89	1.10	45.68	33.33	98.64	86.20	2.03	0.41
Six (N=236)	1507.93	759.61	163.37	72.15	1394.31	687.89	8.37	1.25	52.38	42.17	113.62	107.24	2.07	0.41
Seven (N=25)[1]	1403.44	517.51	142.68	53.72	1314.48	505.85	9.23	1.57	47.24	19.34	88.96	41.82	1.85	0.30
Eight (N=24)[1]	1504.76	666.39	144.79	63.16	1409.38	631.08	9.85	1.76	48.46	20.45	95.38	47.63	1.94	0.33
Nine (N=23)[1]	1566.08	551.06	144.17	44.88	1470.17	519.23	10.21	2.05	50.35	25.69	95.91	61.64	1.85	0.30

[1] The total group of subjects is still in the process of being typed and analyzed. Therefore, the random group has been used as a temporary substitute in grades seven, eight, and nine.

TABLE 2b

AMOUNT OF LANGUAGE: HIGHEST GROUP OF SUBJECTS
MEASURES OF CENTRAL TENDENCY AND VARIABILITY FOR WORDS, COMMUNICATION UNITS, AND MAZES

Grades Kindergarten through Nine

Grade	Total Number of Words in Transcript		Total Number of Communication Units in Transcript		Total Number of Words in Communication Units		Average Number of Words per Communication Unit		Total Number of Mazes in Transcript		Total Number of Words in Mazes		Average Number of Words per Maze	
	Mean	σ	Mean	σ	Mean	σ	Mean	σ	Mean	σ	Mean	σ	Mean	σ
Kindergarten (N=30)	704.60	363.72	105.60	36.06	640.00	333.46	5.76	1.53	23.81	15.10	64.60	61.70	2.61	1.48
One (N=30)	715.60	334.76	93.00	31.73	661.40	296.43	6.89	1.39	20.27	12.13	54.20	52.90	2.23	0.67
Two (N=30)	860.60	348.89	112.50	31.84	803.40	316.44	7.04	1.18	16.53	12.42	57.20	42.60	2.32	0.63
Three (N=30)	930.20	399.70	111.70	34.84	883.90	369.97	7.73	1.33	15.29	9.37	46.30	37.80	2.18	0.60
Four (N=25)	1237.68	507.25	133.32	47.74	1170.48	457.28	8.77	1.08	31.76	23.37	67.20	59.66	2.03	0.37
Five (N=25)	1404.92	545.34	150.40	51.81	1332.24	505.57	8.85	0.95	35.00	24.07	72.68	55.54	1.99	0.31
Six (N=25)	1705.76	653.61	170.12	61.64	1617.60	610.16	9.48	1.12	43.80	25.62	88.16	62.83	1.97	0.24
Seven (N=25)	1905.76	739.74	171.92	70.14	1789.36	681.50	10.53	1.23	58.56	36.61	116.40	90.19	1.89	0.37
Eight (N=25)	1818.32	770.08	156.32	64.27	1718.16	716.29	11.12	1.73	54.24	39.77	100.16	84.78	1.76	0.33
Nine (N=25)	1995.08	882.89	170.28	64.31	1908.40	842.12	11.11	1.90	48.40	31.76	86.68	73.91	1.69	0.24

TABLE 2c

AMOUNT OF LANGUAGE: LOWEST GROUP OF SUBJECTS
MEASURES OF CENTRAL TENDENCY AND VARIABILITY FOR WORDS, COMMUNICATION UNITS, AND MAZES

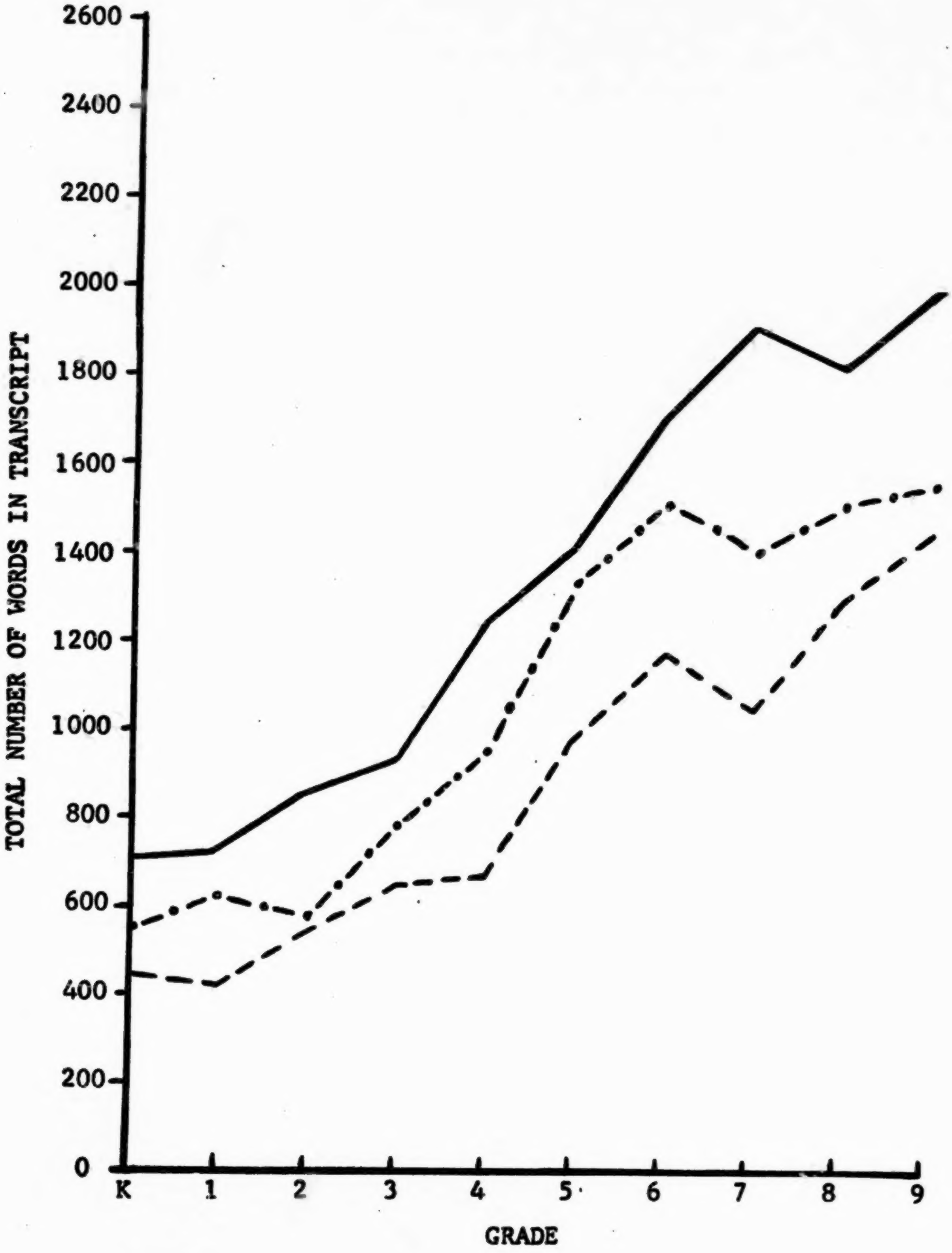
Grades Kindergarten through Nine

Grade	Total Number of Words in Transcript		Total Number of Communication Units in Transcript		Total Number of Words in Communication Units		Average Number of Words per Communication Unit		Total Number of Mazes in Transcript		Total Number of Words in Mazes		Average Number of Words per Maze	
	Mean	σ	Mean	σ	Mean	σ	Mean	σ	Mean	σ	Mean	σ	Mean	σ
Kindergarten (N=22)	453.10	363.81	87.40	48.20	399.10	319.51	4.18	1.29	28.03	22.51	54.00	63.40	2.46	1.11
One (N=22)	432.00	244.91	69.10	23.43	365.00	190.41	4.89	1.36	27.15	21.35	67.00	72.70	2.65	1.52
Two (N=22)	553.60	283.03	89.80	36.34	495.50	252.57	5.49	1.18	23.62	16.27	58.10	53.20	2.52	0.94
Three (N=22)	642.90	346.08	90.10	28.51	574.60	305.61	6.08	1.82	23.01	16.91	68.30	55.50	3.17	2.26
Four (N=24)	681.39	303.45	93.61	32.08	615.00	274.43	6.42	1.20	29.61	18.11	66.39	47.56	2.16	0.49
Five (N=24)	989.25	304.45	128.96	30.26	897.54	265.86	6.90	0.93	41.92	25.71	91.71	73.78	2.03	0.44
Six (N=24)	1179.00	738.92	144.79	77.55	1067.12	663.55	7.19	0.88	46.46	35.03	111.88	109.04	2.27	0.57
Seven (N=25)	1045.88	585.20	117.44	56.49	931.32	516.89	7.72	1.43	51.00	31.78	114.56	89.09	2.02	0.40
Eight (N=25)	1297.88	836.28	142.12	86.68	1170.36	731.25	8.19	1.50	55.80	43.31	127.52	118.69	2.13	0.44
Nine (N=25)	1455.24	789.83	156.88	74.16	1326.52	719.96	8.25	1.43	59.48	37.84	128.72	94.18	2.05	0.37

FIGURE 1a

TOTAL NUMBER OF WORDS IN TRANSCRIPT

High, Low, and Total Group of Subjects
Grades Kindergarten through Nine



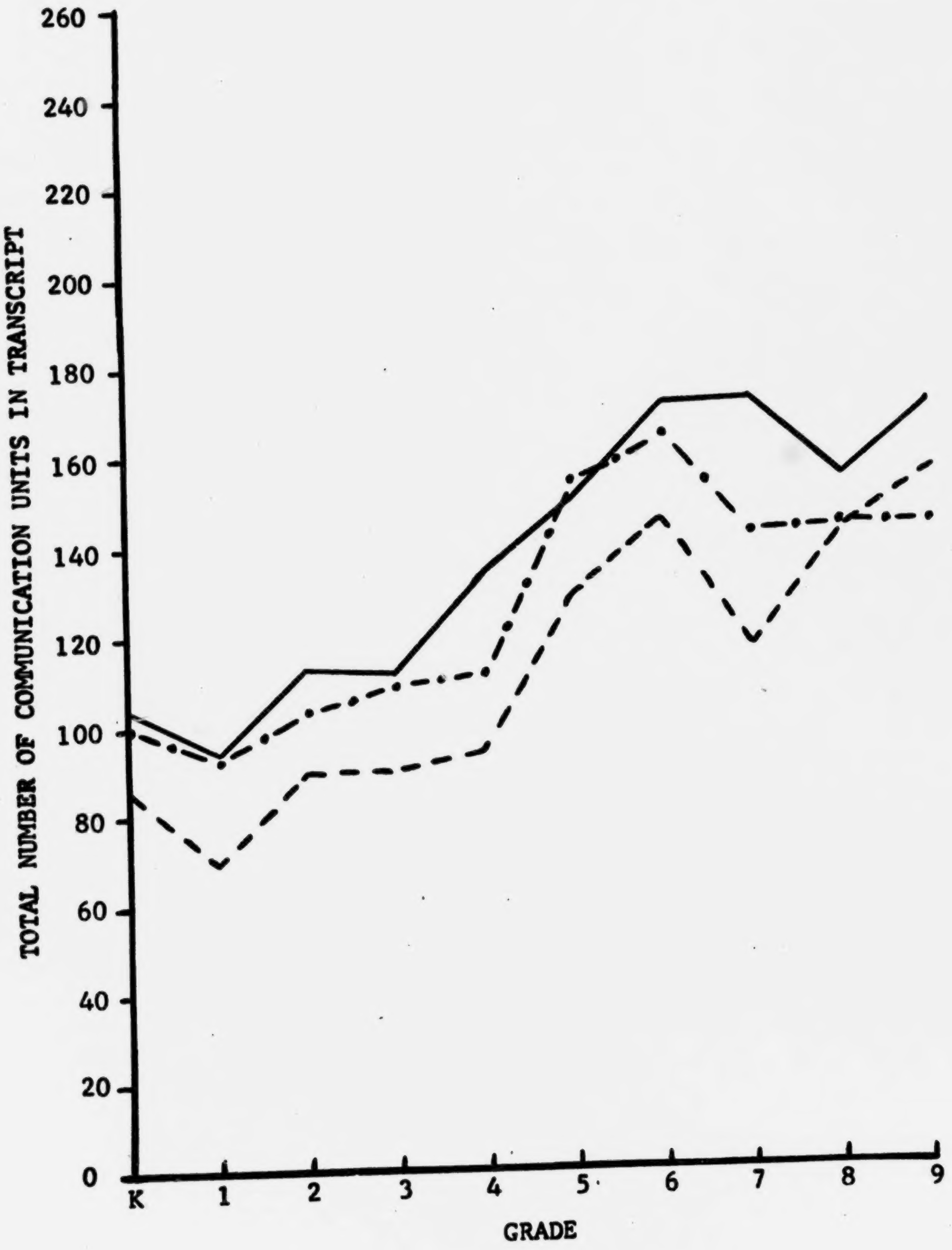
LEGEND
High Group ———
Total Group —•—•—•—
Low Group – – – – – –

The N's for each group
are shown in
Tables 2a, 2b, and 2c.

FIGURE 1b

TOTAL NUMBER OF COMMUNICATION UNITS IN TRANSCRIPT

High, Low, and Total Group of Subjects
Grades Kindergarten through Nine



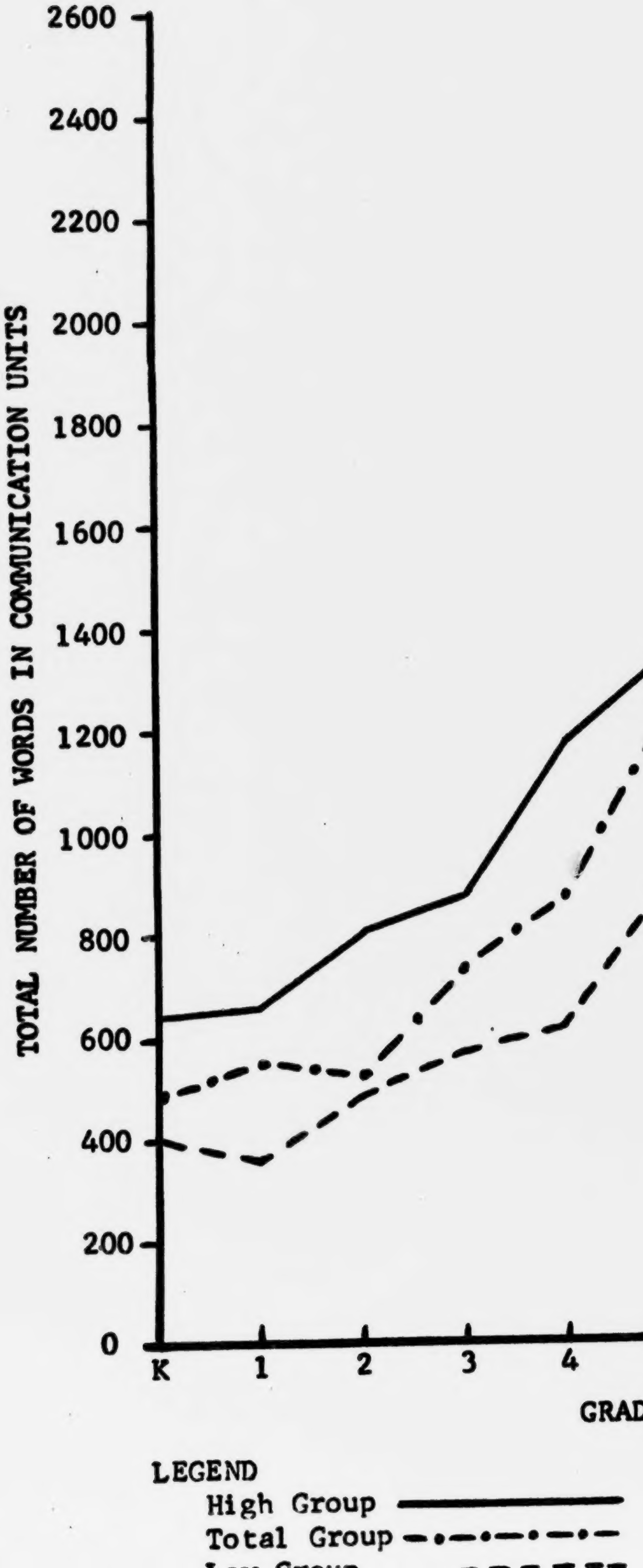
LEGEND
High Group ———

The N's for each group
are shown in

FIGURE 1c

TOTAL NUMBER OF WORDS IN COMMUNICATION UNITS

High, Low, and Total Group of Subjects
Grades Kindergarten through Nine

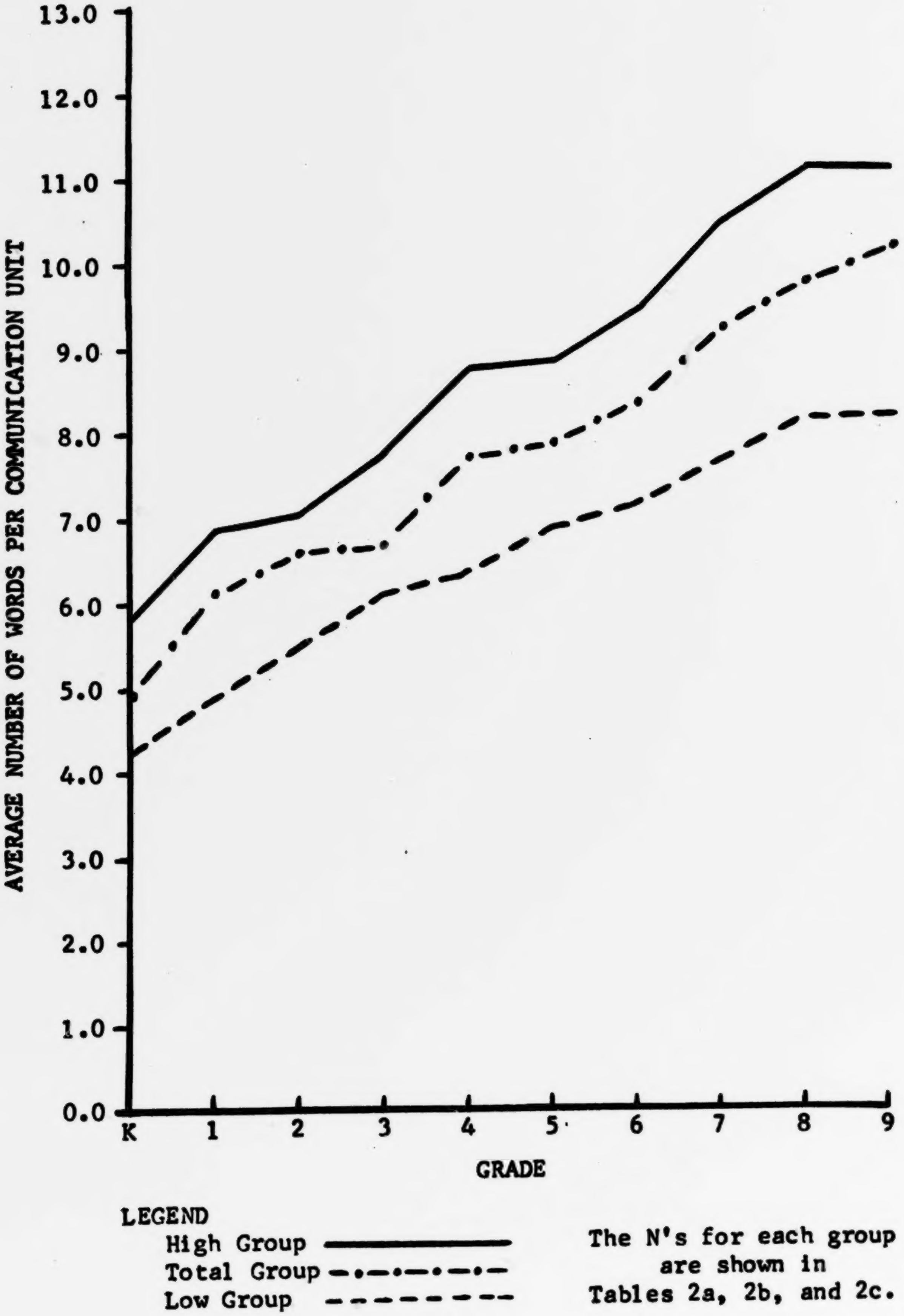


The N's for each group are shown in Tables 2a, 2b, and 2c.

FIGURE 1d

AVERAGE NUMBER OF WORDS PER COMMUNICATION UNIT

High, Low, and Total Group of Subjects
Grades Kindergarten through Nine

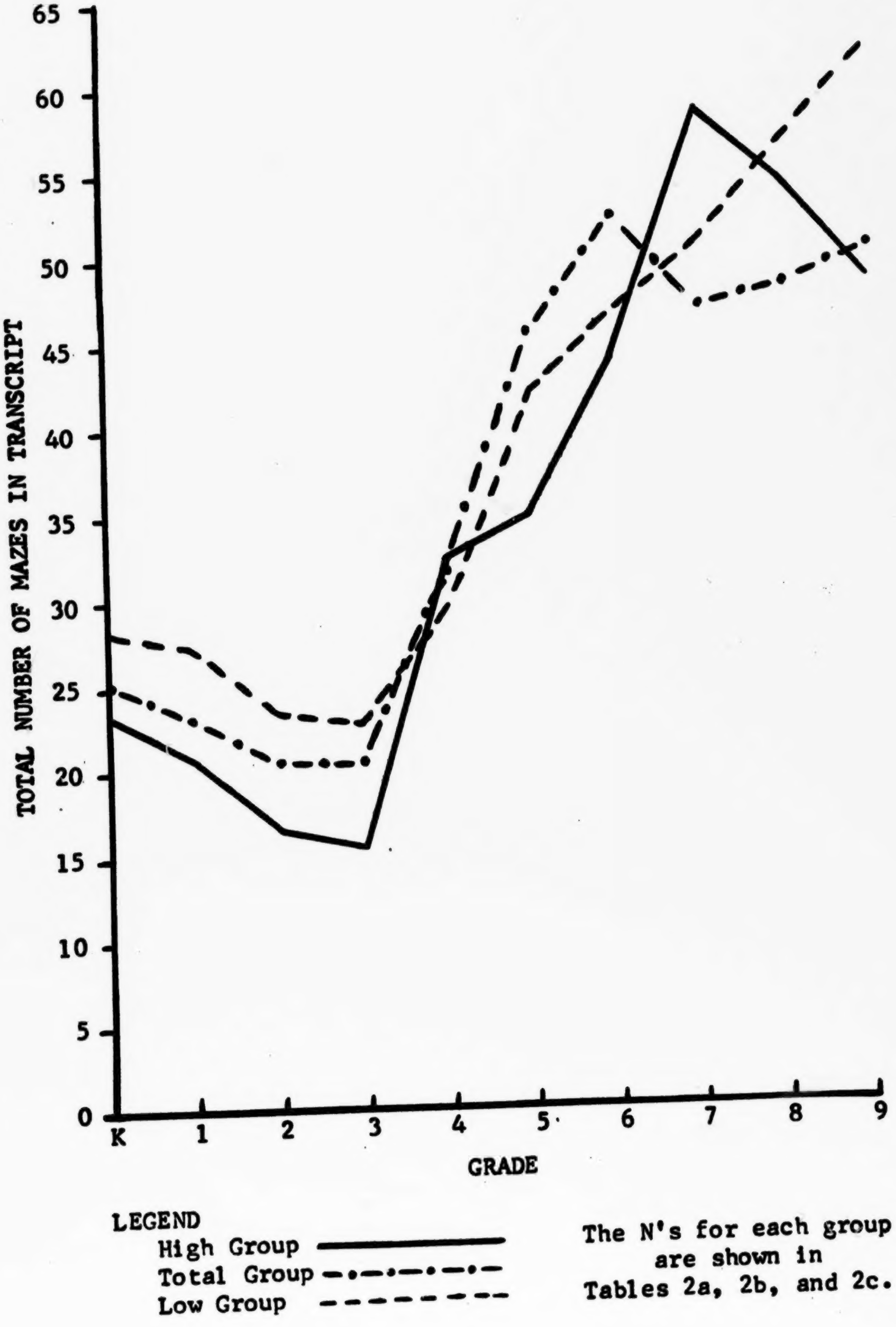


The N's for each group are shown in Tables 2a, 2b, and 2c.

FIGURE 1e

TOTAL NUMBER OF MAZES IN TRANSCRIPT

High, Low, and Total Group of Subjects
Grades Kindergarten through Nine

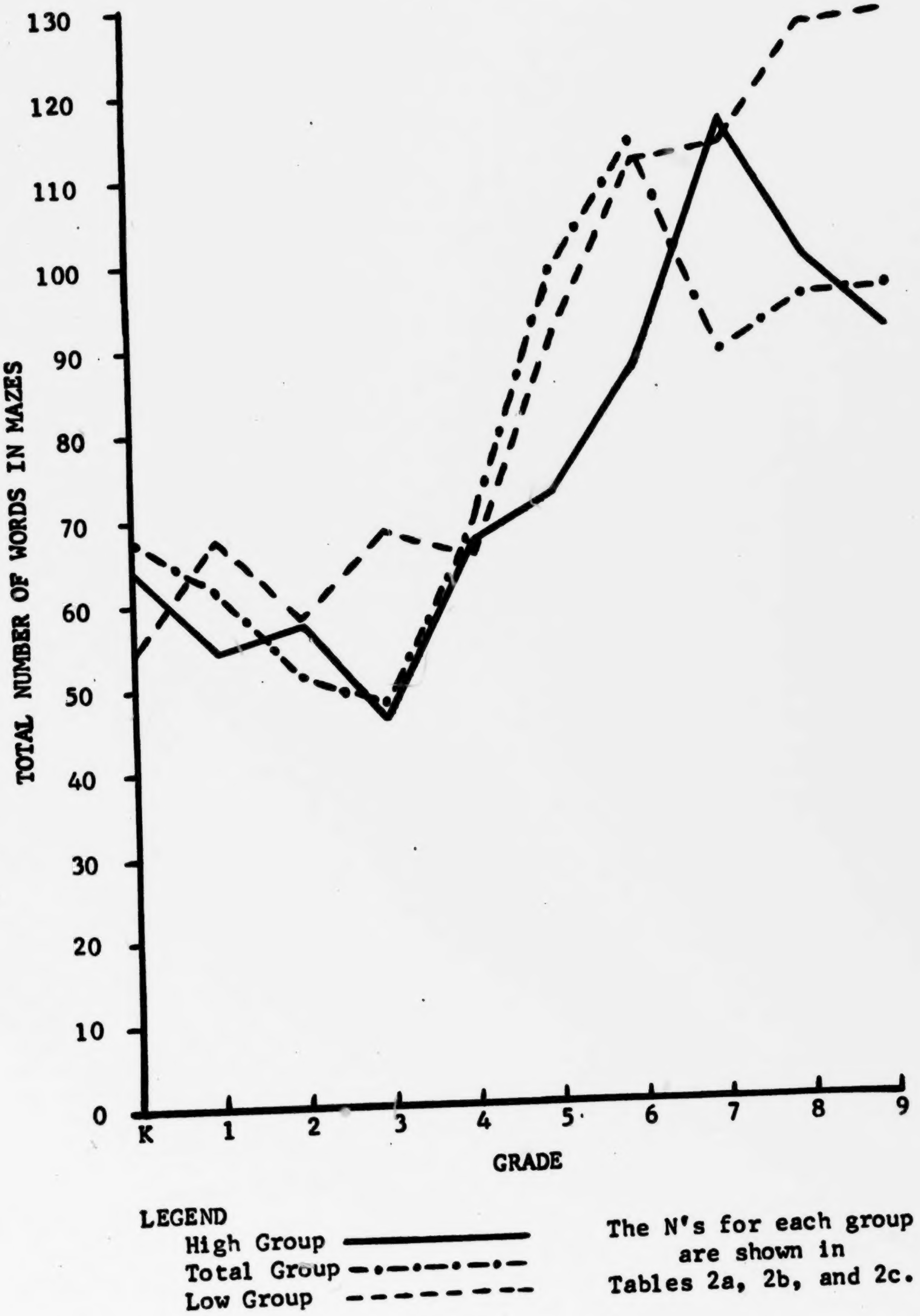


The N's for each group
are shown in
Tables 2a, 2b, and 2c.

FIGURE 1f

TOTAL NUMBER OF WORDS IN MAZES

High, Low, and Total Group of Subjects
Grades Kindergarten through Nine

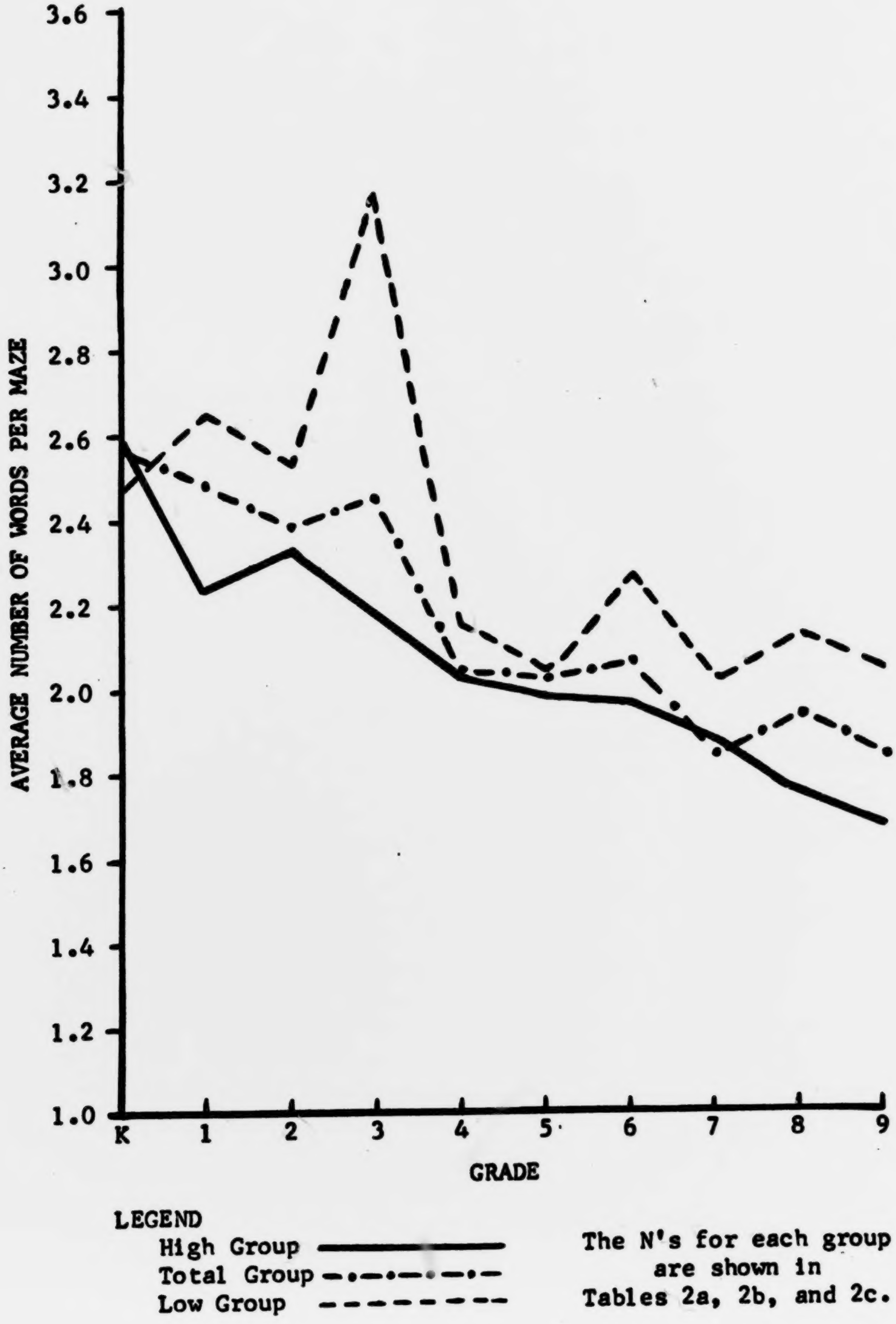


The N's for each group are shown in Tables 2a, 2b, and 2c.

FIGURE 1g

AVERAGE NUMBER OF WORDS PER MAZE

High, Low, and Total Group of Subjects
Grades Kindergarten through Nine



The N's for each group
are shown in
Tables 2a, 2b, and 2c.

On total number of words in the transcripts, as indicated by the increasing mean in column one, the subjects as a whole speak more words in each of the succeeding years, increasing notably in grades four, five, and six. (See Table 2a.) During these ten years they also increase the number of communication units up through grade six and the average number of words spoken in each of those communication units through grade nine. That is, in grades seven, eight, and nine the subjects are developing more complexity of expression, using fewer units but more words per unit.[1]

A direct comparison of the high and low groups on total number of words in the transcripts (Tables 2b and 2c) makes it obvious that the high group exceeded the low group in every year of the study. This is also the case with average words per communication unit. Both groups made a steady increase from year to year, but the high group consistently exceeded the low group by two or three words. The range in performance as shown by the standard deviation for words per communication unit was about the same for both groups.

The mazes show a different pattern. In the first four years (kindergarten through third grade), the total group and the high group show a steady decrease in the number of mazes and words in mazes from year to year. However, for the low group, the average number of words per maze increases. By comparing the high and low groups, the reader will see that two contrary trends are operating among the subjects. In grades kindergarten through three those who are rated as skillful with language are reducing both their incidence of mazes and the number of words per maze: their number of mazes decreases 35 per cent; their variability on words per maze decreases more than 50 per cent. On the other hand, those rated less skillful with language are increasing both the average number of words and the variability of the number of words they use in each maze whereas the number of mazes they are using is decreasing only half as rapidly (an 18 per cent decrease).

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[1] The reader should bear in mind that the random group has been used to represent the total group for grades seven, eight, and nine.

When examining mazes and words in mazes (Figures 1e and 1f), much of the data appear to be completely jumbled, showing no clear superiority of one group over another. However, this merely shows how important it is to examine not only raw figures on mazes and words in mazes but also their percentage relation to total volume of language, total words in units, and the number of communication units per transcript. These percentage relations are shown in Table 3 and are presented graphically in Figures 2a, 2b, and 2c.[1] A study of these figures makes it obvious that even though the high group actually exceeds the low group in some years on the raw number of mazes and the raw number of words in mazes, in relation to total words, words in units, and communication units, the high group continues to have far less a proportion of mazes and words in mazes than does the low group. In this percentage comparison it should also be borne in mind that the low group always has a lower average words per communication unit and thus has less chance of having a maze in any given communication unit. The low group also uses less complexity of expression (fewer subordinate clauses, appositives, infinitives, and verbal phrases) than does the high group. But in spite of all this, the low group still has a higher percentage of mazes in relation to communication units than does either the total group or the high group.

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[1] Table 3 has been computed directly from Tables 2a, 2b, and 2c.

At present we have ten years by which to judge mazes and we may see from the data in Tables 2b and 2c that the high group is reducing both the number and the variability of words per maze whereas the low group, on this obstacle to fluency, is more erratic in its performance. Furthermore, the high proportion of mazes and words in mazes for the low group occurs in spite of the fact that communication units and words per communication unit have a lower incidence in this group than in the high group. In other words, the members of the low group say less and many of them have more difficulty in saying it. However, many of the subjects in the low group are Negro and speak a different English dialect at home; as a result, some of the mazes may be caused by the problem of using what is tantamount to a second language for them.

TABLE 3

RELATION OF RAW FIGURES ON MAZES AND WORDS IN MAZES TO TOTAL WORDS, WORDS IN UNITS, AND COMMUNICATION UNITS

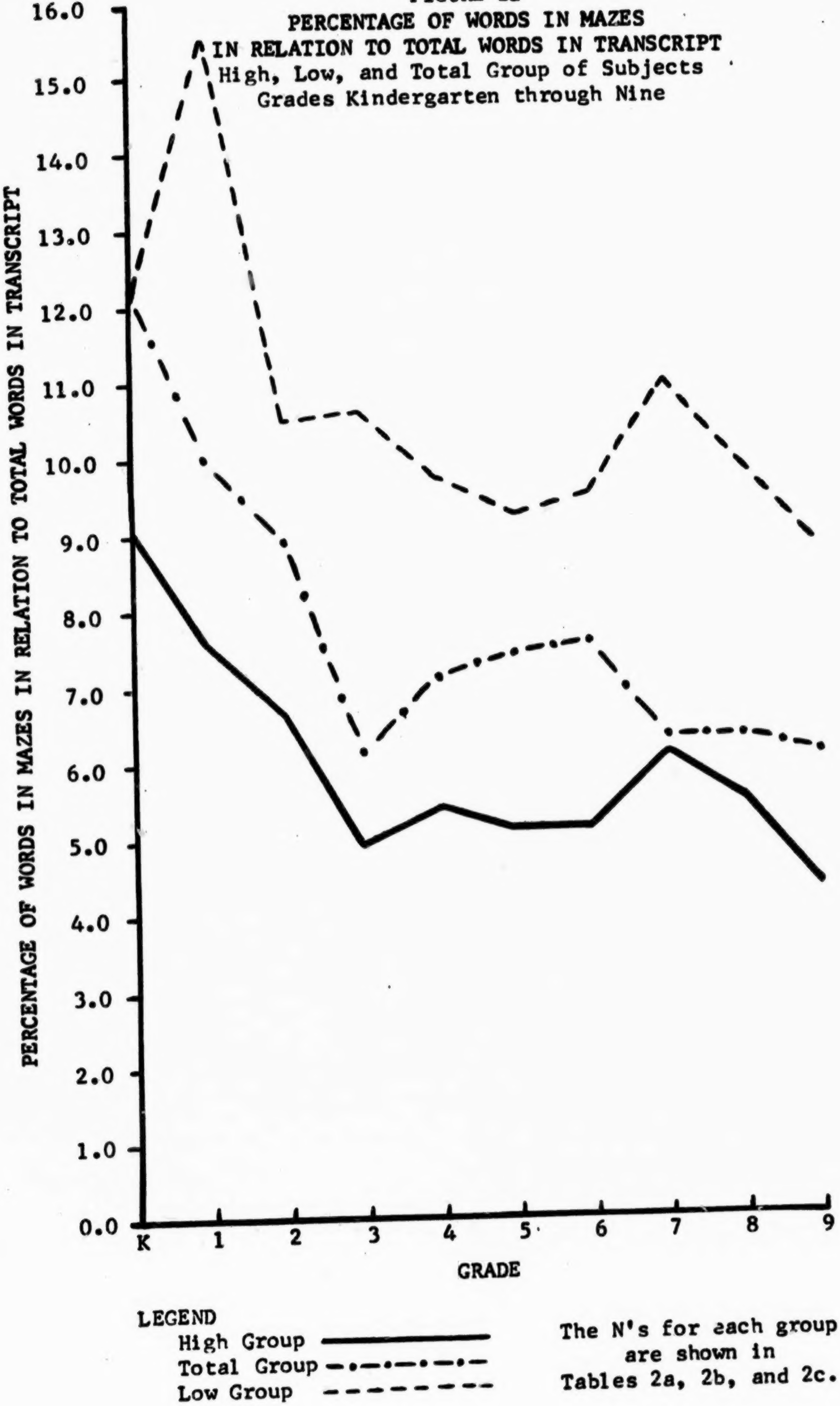
High, Low, and Total Group of Subjects[1]
Grades Kindergarten through Nine

	Percentage of Words in Mazes in Relation to Total Words in Transcript			Percentage of Mazes in Relation to Total Words in Communication Units			Percentage of Mazes in Relation to Communication Units		
Grade	High Group	Low Group	Total Group[2]	High Group	Low Group	Total Group[2]	High Group	Low Group	Total Group[2]
Kinder-garten	9.17	11.92	12.30	3.72	7.02	5.20	22.55	32.07	25.38
One	7.57	15.51	9.97	3.06	7.44	4.16	21.80	39.29	25.16
Two	6.65	10.49	8.88	2.06	4.77	3.89	14.69	26.30	19.90
Three	4.98	10.62	6.15	1.73	4.00	2.81	13.69	25.54	18.67
Four	5.43	9.74	7.11	2.71	4.81	3.59	23.82	31.63	28.33
Five	5.17	9.27	7.41	2.63	4.67	3.71	23.27	32.51	29.74
Six	5.17	9.49	7.53	2.71	4.35	3.76	25.75	32.09	32.06
Seven	6.11	10.95	6.34	3.27	5.48	3.59	34.06	43.43	33.11
Eight	5.51	9.83	6.34	3.16	4.77	3.44	34.70	39.26	33.47
Nine	4.34	8.85	6.12	2.54	4.48	3.42	28.42	37.91	34.92

[1] The N's for each group are shown in Tables 2a, 2b, and 2c.

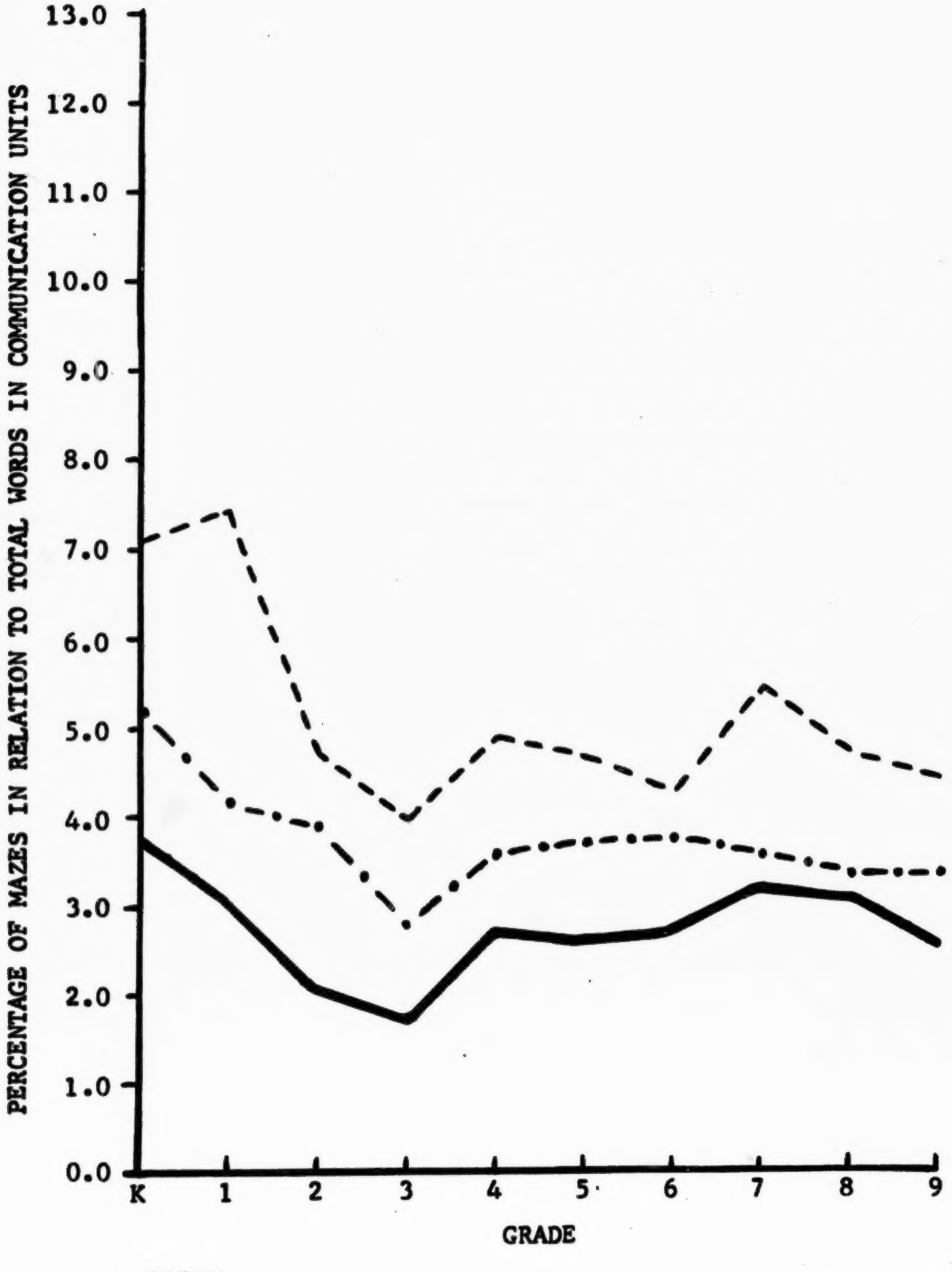
[2] The total group of subjects is still in the process of being typed and analyzed. Therefore, the random group has been used as a temporary substitute in grades seven, eight, and nine.

FIGURE 2a
PERCENTAGE OF WORDS IN MAZES
IN RELATION TO TOTAL WORDS IN TRANSCRIPT
High, Low, and Total Group of Subjects
Grades Kindergarten through Nine



The N's for each group are shown in Tables 2a, 2b, and 2c.

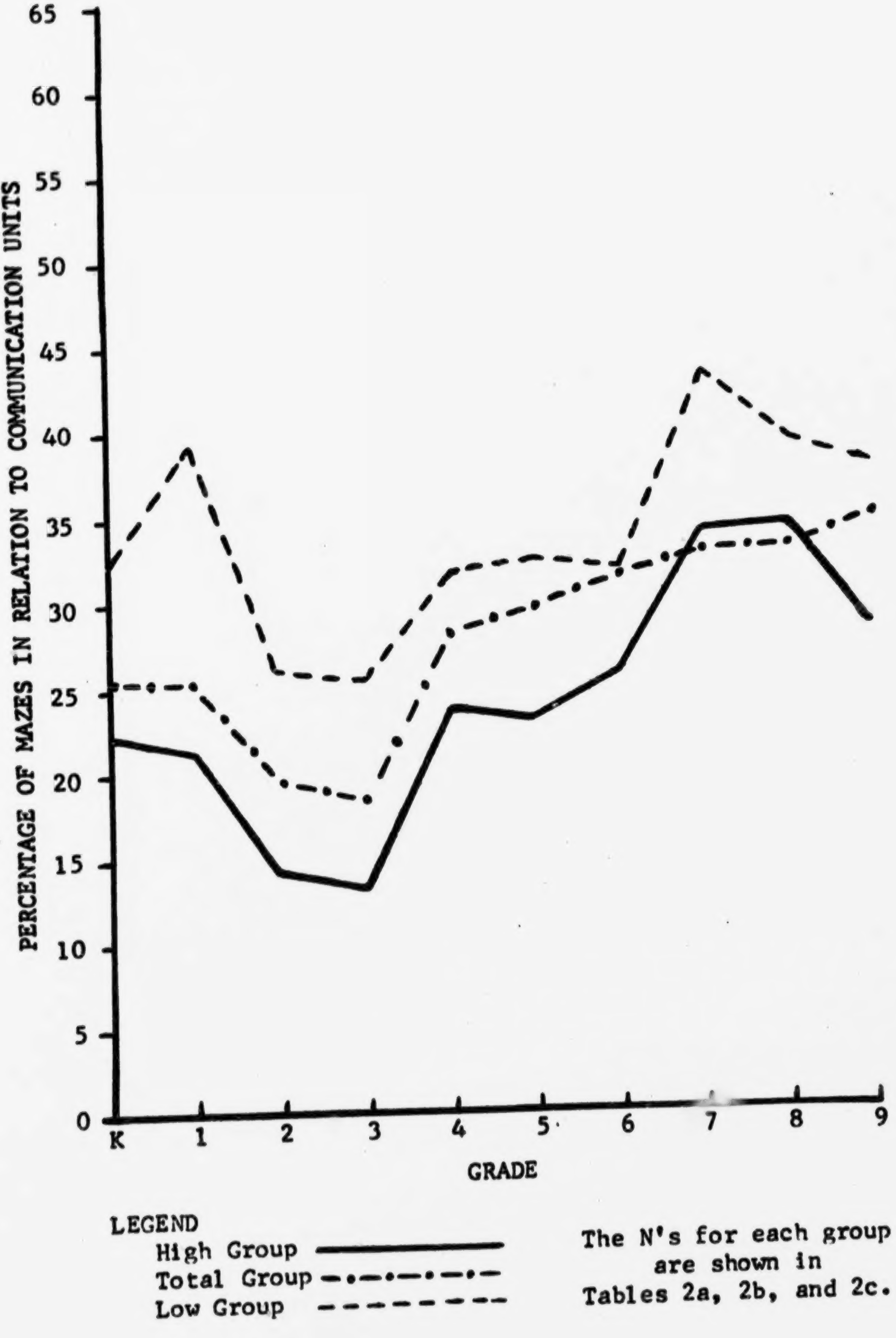
FIGURE 2b
PERCENTAGE OF MAZES
IN RELATION TO TOTAL WORDS IN COMMUNICATION UNITS
High, Low, and Total Group of Subjects
Grades Kindergarten through Nine



LEGEND
High Group ————
Total Group —•—•—•—
Low Group – – – – –

The N's for each group are shown in Tables 2a, 2b, and 2c.

FIGURE 2c
PERCENTAGE OF MAZES
IN RELATION TO COMMUNICATION UNITS
High, Low, and Total Group of Subjects
Grades Kindergarten through Nine



The N's for each group
are shown in
Tables 2a, 2b, and 2c.

Studying the data for words and mazes, however, is not sufficient. We must also see how the subjects behave when they use words in syntactic units that communicate meaning. For this we turn to a scrutiny of the communication units. For the number of communication units, Table 4 shows the median and inter-quartile ranges for the two groups (grades one through nine), and Figure 3 graphically presents the medians for the two groups as well as the medians for the total group.[1] For the high and low groups, the overlapping is fairly large as can be seen by comparing the inter-quartile ranges. However, the medians of the high and low groups never cross; the high group always maintains its lead on amount of communication units.[2] This is particularly impressive in view of the later finding that the high group is using more subordination than the low group, thus reducing the number of communication units by combining them in complex fashion. Even so, the high group still exceeds the low group in number of communication units.

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[1] Tables 2a, 2b, and 2c, which were presented earlier, contain data on the arithmetic mean and standard deviation for communication units, and Figure 1b was a graphic presentation of this same arithmetic mean.

[2] The median for total group consistently falls between that of the high and low groups. However, in Figure 3 for grades eight and nine, this is not the case. In all likelihood this is a result of using the random group as a substitute for the total group for these years.

TABLE 4

NUMBER OF COMMUNICATION UNITS FOR HIGH AND LOW GROUPS[1]

Median, Inter-quartile Range, and Total Range
Grades Kindergarten through Nine

Grade	Median		Inter-quartile Range		Total Range	
	High	Low	High	Low	High	Low
Kindergarten	102	68	72 to 125	45 to 113	24 to 214	3 to 207
One	86	71	69 to 99	44 to 90	41 to 139	24 to 138
Two	104	85	80 to 131	59 to 120	56 to 225	15 to 200
Three	111	87	84 to 146	63 to 107	51 to 203	33 to 162
Four	128	92	84 to 162	76 to 108	51 to 245	42 to 208
Five	148	125	107 to 198	98 to 150	77 to 253	35 to 257
Six	188	129	132 to 223	94 to 168	101 to 329	49 to 249
Seven	165	92	111 to 218	74 to 160	82 to 357	43 to 296
Eight	147	129	115 to 175	79 to 175	57 to 373	47 to 450
Nine	171	143	116 to 201	95 to 225	83 to 356	44 to 302

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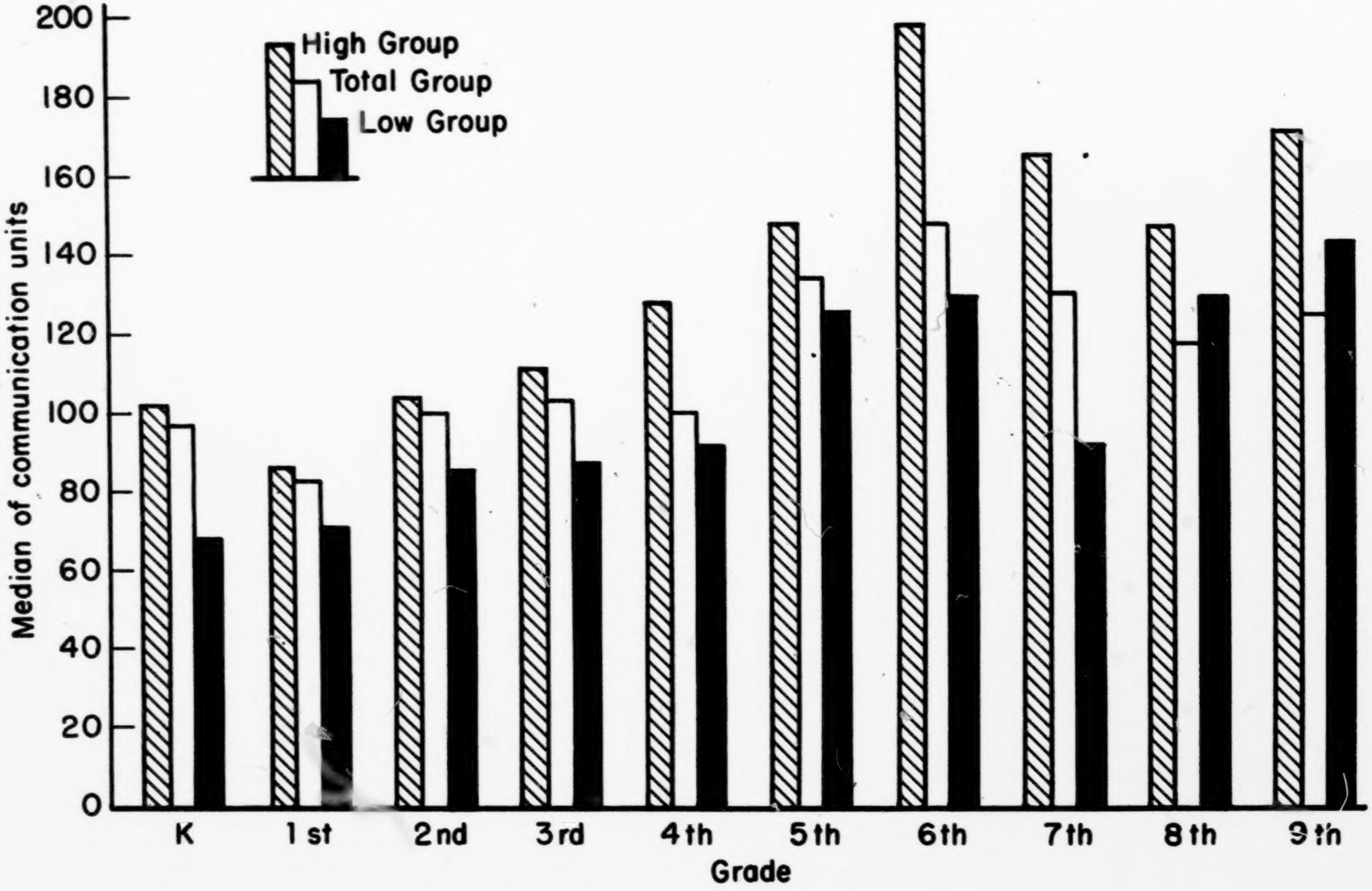
[1] The N's for the high and low groups are shown in Tables 2b and 2c.

FIGURE 3

MEDIANS FOR NUMBER OF COMMUNICATION UNITS

High, Low, and Total Group of Subjects
Grades Kindergarten through Nine



The N's for all groups are shown in Tables 2a, 2b and 2c.

To show consistency of performance for all subjects on the number of communication units, correlation coefficients were obtained for the scores of the same individuals from one grade to the next for grades one through six. These correlations are given in Table 5. The results show that, in relation to the group, individuals are maintaining consistency of performance on the number of units of communication they use.

From one school year to another children high in language ability maintain their initial superiority over those low in language ability in respect to the amount of meaningful language used, greater number of communication units, and greater complexity (as evidenced by a higher average words per unit). In respect to mazes, members of both groups continue to have trouble with expression from year to year, but those in the high group are more fluent and are gaining greater control over this fluency.

TABLE 5

CONSISTENCY OF LINGUISTIC PERFORMANCE:
CORRELATIONS OF AMOUNT OF LANGUAGE FROM YEAR TO YEAR
ON TWO MEASURES OF LINGUISTIC PERFORMANCE[1]

Grades Being Correlated	Average Number of Words per Communication Unit	Teacher's Rating of Language Ability
Grade One and Grade Two (N=227)	.728	.842
Grade Two and Grade Three (N=207)	.741	.816
Grade One and Grade Three (N=207)	.402	.751
Grade One and Grade Six (N=196)	.324	.657

[1] All correlations are significant at the 1 per cent level. Determined by consultation of the Wallace and Snedecor Tables. Coefficients of correlation and t ratios are significant at the 5 and 1 per cent level for varying degrees of freedom reported in J. P. Guilford, *Fundamental Statistics in Psychology and Education*. New York: McGraw-Hill; 1950, p. p. 609.

In respect to vocabulary, it seems logical that children with large and readily accessible vocabularies would find expression easier than those with limited vocabularies. Certainly vocabulary ought to be included in any examination of verbal fluency. In this research, evidence both of quantity and quality of vocabulary is available from four sources. First, we have for all subjects their position on the vocabulary test administered in the kindergarten. Second, for all subjects, there are the teachers' ratings on vocabulary, one subsection of the Teachers' Rating Scale. Third, we have the type-token ratios for the two subgroups, indicating the diversification of their vocabulary. Lastly, for the two subgroups we have their vocabulary classified according to frequency of use in the English language.

On the Kindergarten Vocabulary Test of 100 items, the median for the high group was 67; for the low group the median was 35. For the total group of subjects the scores varied from 3 to 83 with a mean of 50.46. Table 6 presents the mean and standard deviation for this test, and Figure 4 presents the frequency distribution in graphic form.[1]

TABLE 6

MEASURES OF CENTRAL TENDENCY AND VARIABILITY
FOR VOCABULARY TEST AND TEACHER'S RATING

Total Group of Subjects in Kindergarten

	N	Mean	σ
Scores on Kindergarten Vocabulary Test of 100 items	320	50.46	15.35
Teacher's Rating	317	3.27	0.84

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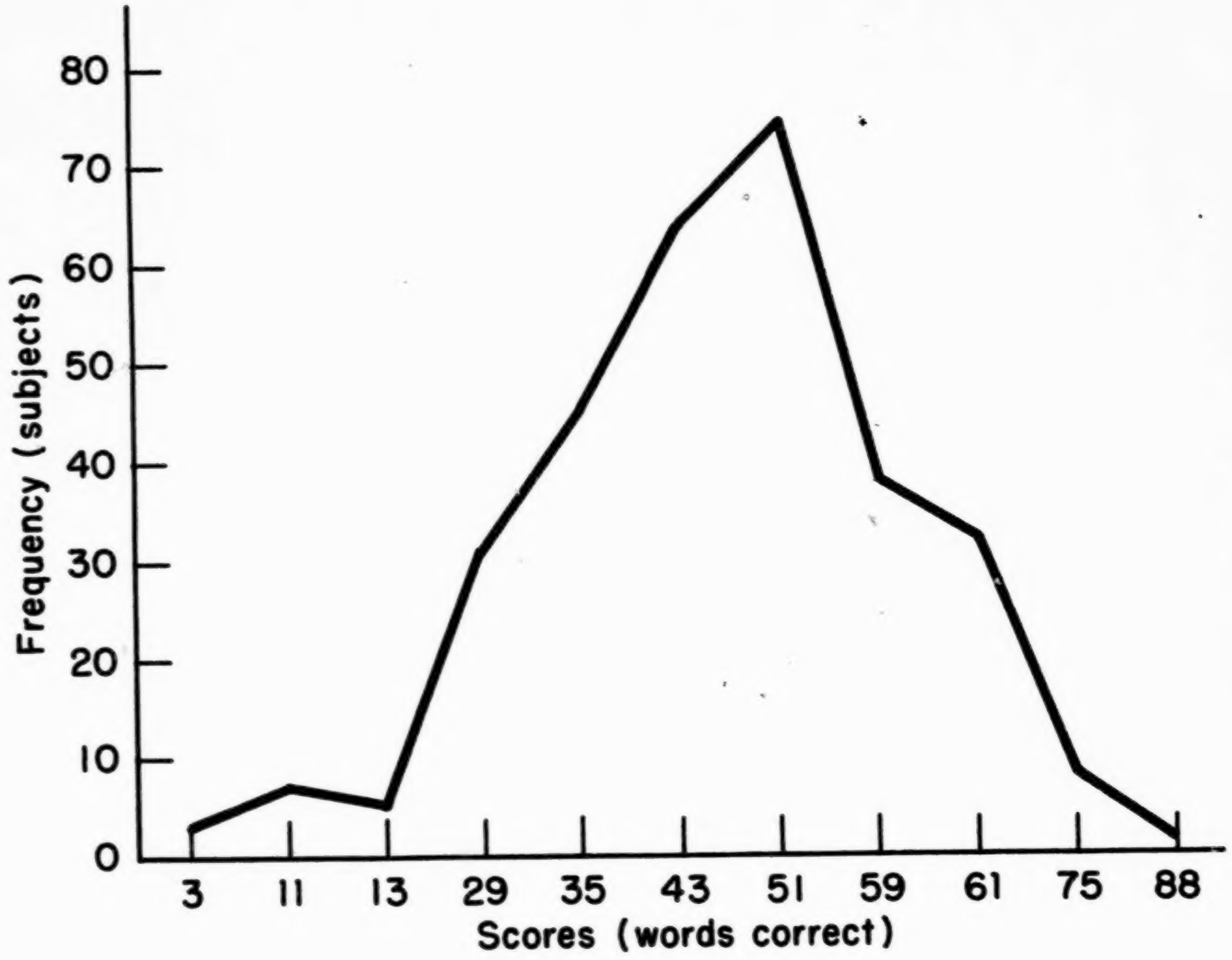
[1] For the purposes of validation as well as for evidence on vocabulary, the investigator computed the medians for the low and high groups on the section of the teacher's rating scale which dealt with vocabulary. The median for the high group is 4.51 and for the low group, 1.94.

FIGURE 4

THE FREQUENCY DISTRIBUTION FOR SCORES
ON THE KINDERGARTEN VOCABULARY TEST (100 items)

Total Group of Subjects



For British children at the same age, Watts, who devised the Kindergarten Vocabulary Test, gives a score of 53 as a norm.[1] He demonstrates that the vocabulary in his test does sample fairly evenly the first, second, third, fourth, fifth, and sixth thousands of most commonly used words in the American Teacher's Word Book by E. L. Thorndike. Inasmuch as the 100 words in his vocabulary test are fairly evenly spread throughout the list of the six thousand most common words, Watts considers it reasonable to estimate that the probable size of a child's vocabulary--within a ten per cent error--is sixty times the number right on his test. In accordance with this reasoning, the subjects in the present study--at the kindergarten level--vary in vocabulary from 180 to about 5,000 words with 3,000 words as an average.[2] In comparison with similar results by other research workers such as Smith, these figures seem valid.[3] The size of the total vocabulary for children of this age is still a controversial issue, however, and some investigators do not agree with Smith's and Watts' estimates or methods of arriving at them. However, in terms of extent of vocabulary, the central tendency and variance support the hypothesis that the subjects in this study represent a larger universe of children.

For diversity of vocabulary the type-token ratio has been computed on language samples of uniform size. When the number of words in the language

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[1] Watts, op. cit., p. 50. Watts does not describe his sample.

[2] The lowest figure, 180, may seem exceptional, but this was a child who at the time of the test spoke Chinese and only a small amount of English.

[3] M. E. Smith, "An Investigation of the Development of the Sentence and the Extent of Vocabulary in Young Children," Child Welfare, 3: 5 (1926). Iowa City: University of Iowa.

samples are kept equal, subjects using only a few words repetitiously receive lower median scores on diversity of vocabulary than those using a more varied choice of words. Table 7 shows a type-token comparison for the high and low groups from kindergarten through grade nine for matched sections of the overall transcripts, and the data are also shown graphically (Figures 5a, 5b, 5c, and 5d).[1] The medians shown were determined by dividing the total number of words in the section of each subject's transcript which was to be studied into segments of equal length (100 words). Then for each 100-word segment the new words that had not appeared before in any preceding segment were counted.[2]

As can be seen in Table 7 and in the graphic presentation, the medians for the high group consistently exceed those for the low group in every segment compared with the exception of kindergarten for the first segment. (On this segment the two groups are virtually identical.) Thus on a total of thirty-one 100-word segments on which a comparison could be made, the high group exceeded the low group thirty times whereas the low group exceeded the high group only once. Obviously, the type-token evidence is clear: the high group has a substantially greater diversity of vocabulary.

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[1] When looking at these figures, note that the scales have been broken and begin at slightly different points. This was done to facilitate visual comparison by making similar numerical differences maintain approximately the same relationship to each other on the individual graphs.

[2] This procedure is necessary in order to control the comparison. Unequal segments should never be compared inasmuch as subjects who use the most words would be penalized if the types (number of different words) were divided by the tokens (total number of words).

TABLE 7

TYPE-TOKEN COMPARISON OF HIGH AND LOW GROUPS FOR NINE 100-WORD SEGMENTS OF SPOKEN LANGUAGE[1]

Grades Kindergarten through Nine
High N = 25 Low N = 25

		Ratio According to Segments of Words (by Each 100 Words)[2]								
Grade	Group	First 100	Second 100	Third 100	Fourth 100	Fifth 100	Sixth 100	Seventh 100	Eighth 100	Ninth 100
Kindergarten	High	51	43							
	Low	52	--							
One	High	60	38							
	Low	53	--							
Two	High	59	45							
	Low	53	--							
Three	High	58	39							
	Low	54	--							
Four	High	58	41	32	28					
	Low	53	36	--	--					
Five	High	58	43	32	28	24				
	Low	51	35	27	24	--				
Six	High	60	39	36	32	25	23	22		
	Low	51	33	26	24	--	--	--		
Seven	High	61	40	36	29	30	22	19	17	19
	Low	53	34	27	24	--	--	--	--	--
Eight	High	61	43	37	31	29	27	23	19	
	Low	54	36	31	22	21	17	--	--	
Nine	High	61	41	34	29	30	25	26	24	22
	Low	54	36	28	24	23	20	20	--	--

[1] A median was not computed for any segment in which N dropped below 10. The high group consistently uses more language than the low group, and as a result the high group has more usable segments on this criteria of only using a segment in which N is 10 or larger.

[2] Each ratio equals the number of different (new) words in each segment divided by the total number of words in each segment.

FIGURE 5a

TYPE-TOKEN COMPARISON OF HIGH AND LOW GROUPS
MEDIAN NUMBER OF TYPES FOR FIRST SEGMENT

Grades Kindergarten through Nine

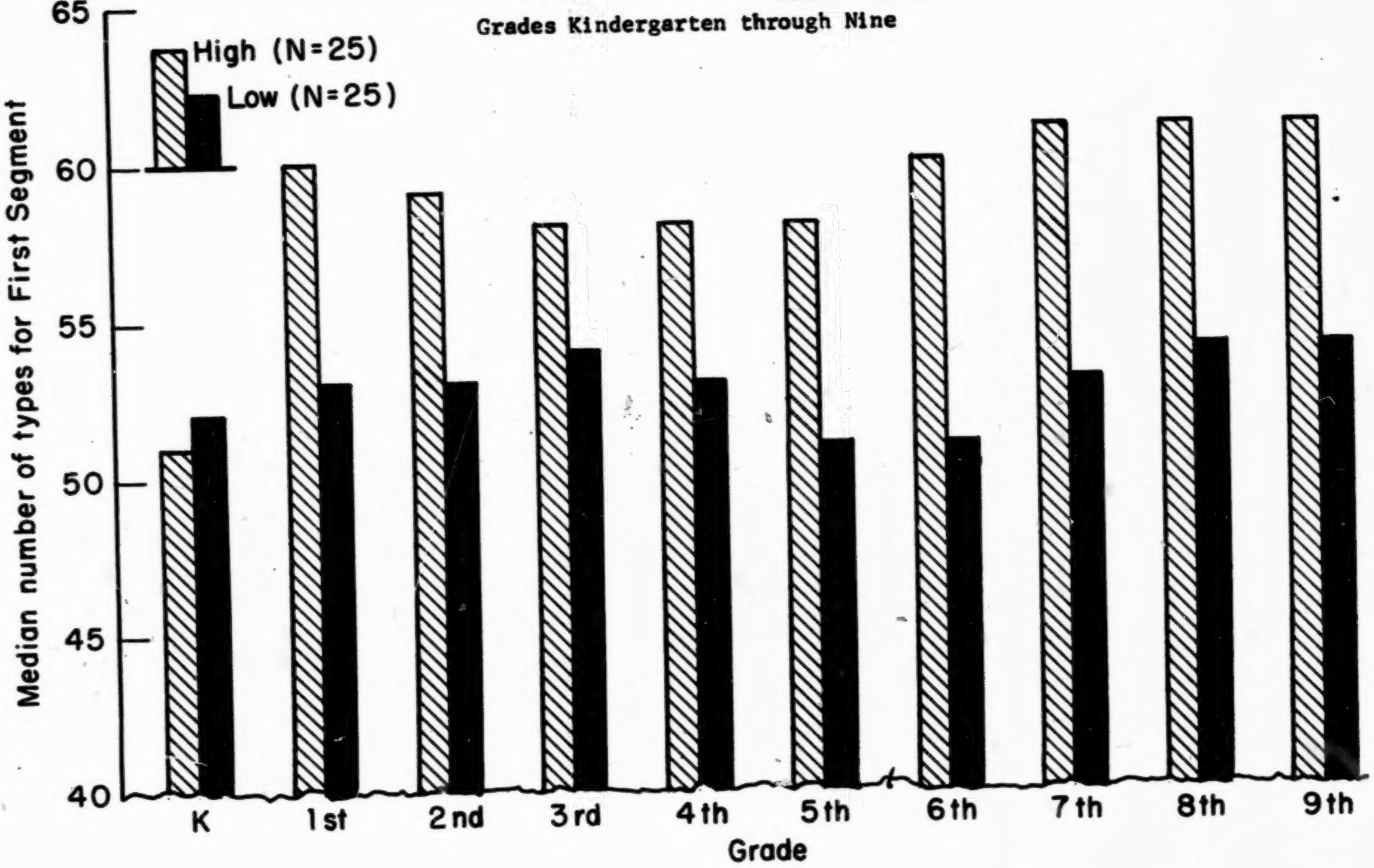


FIGURE 5b

TYPE-TOKEN COMPARISON OF HIGH AND LOW GROUPS
MEDIAN NUMBER OF TYPES FOR SECOND SEGMENT

Grades Kindergarten through Nine

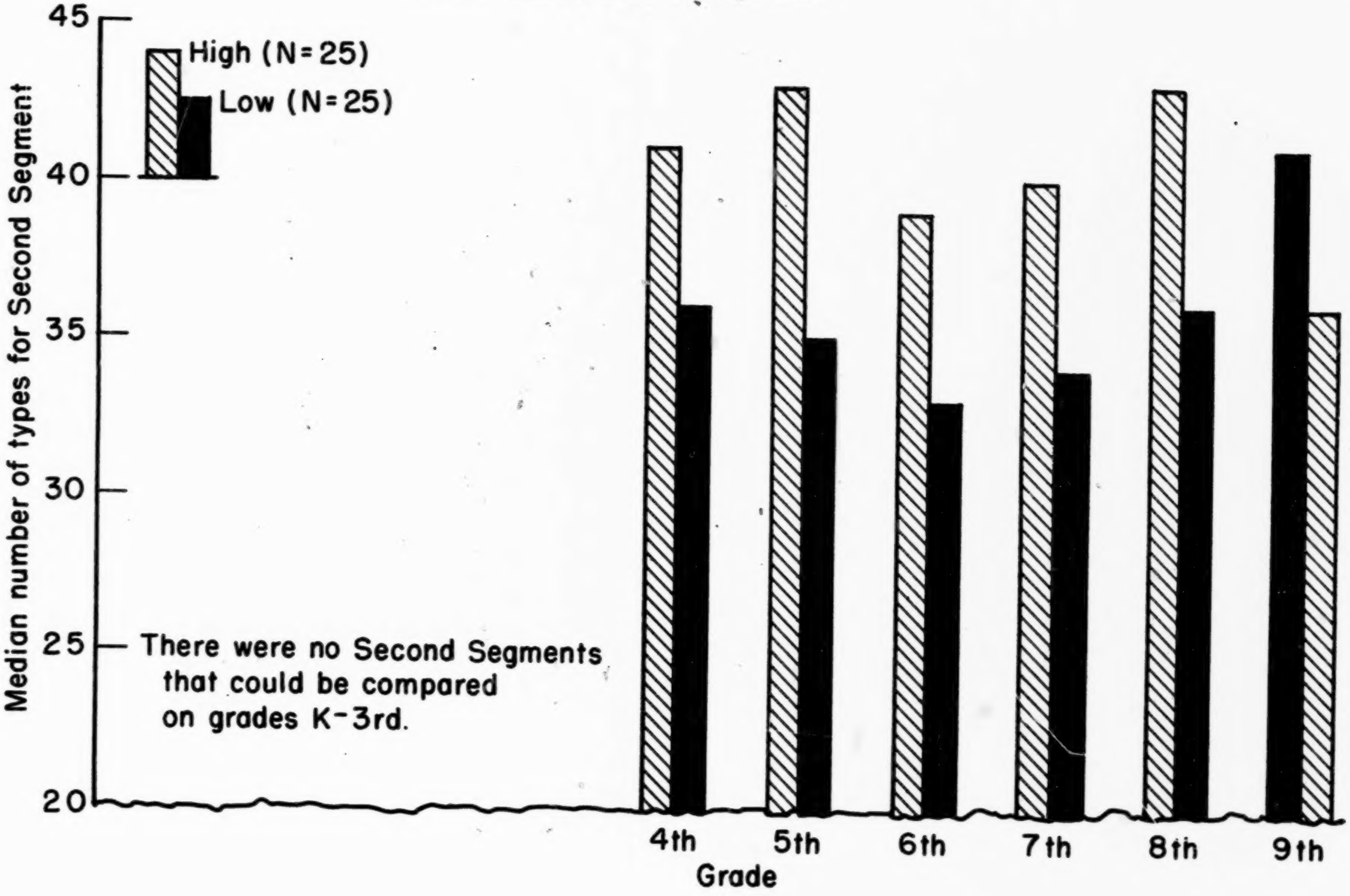


FIGURE 5c

TYPE-TOKEN COMPARISON OF HIGH AND LOW GROUPS
MEDIAN NUMBER OF TYPES FOR THIRD SEGMENT

Grades Kindergarten through Nine

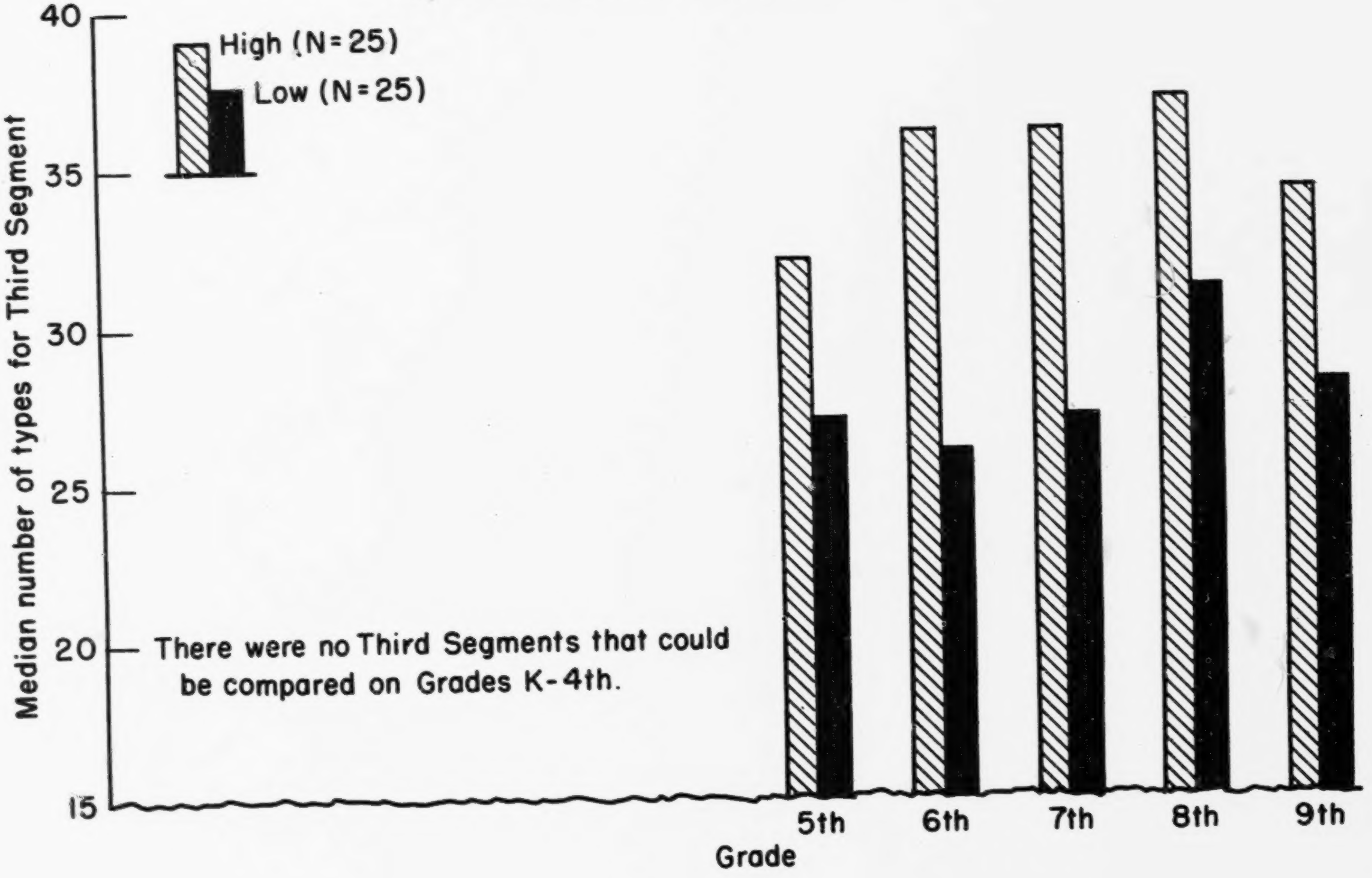
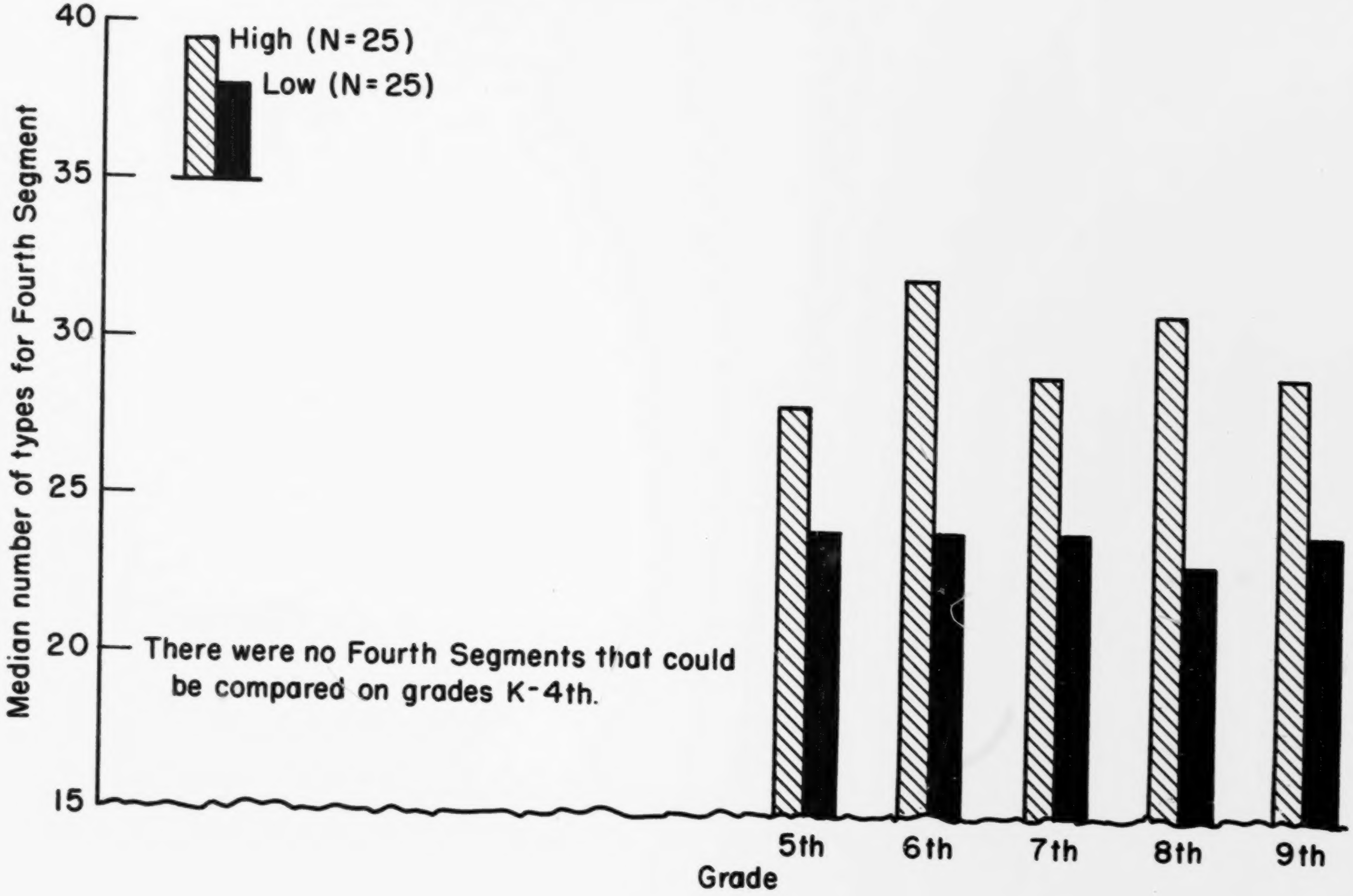


FIGURE 5d

TYPE-TOKEN COMPARISON OF HIGH AND LOW GROUPS
MEDIAN NUMBER OF TYPES FOR FOURTH SEGMENT

Grades Kindergarten through Nine



Given the evidence that the high group is superior on diversity of vocabulary, the question is then whether the high group confines this superiority to the more commonly used words or whether they also use a greater height of vocabulary. The frequency of occurrence of English words has been determined and made available in The Teacher's Word Book of 30,000 Words.[1] Through a classification of the words used by the high and low groups, we can contrast these two groups on height of vocabulary. How many commonly used words appear in their spoken language? Such words will be among the first 500 and the 500 to 1000 word groupings in The Teacher's Word Book. How many unusual words will they use? Such words will be among the higher thousands reported in The Teacher's Word Book.

Although it is true that the Thorndike-Lorge count in The Teacher's Word Book is based on written materials, the classification for oral language should still be revealing. Another weakness could result from words like television, uncommon at the time of the Thorndike-Lorge count. To guard against having these words affect the tally, The Teacher's Word Book was read word-by-word, and those words (such as television, jet, atomic, etc.) which seemed as if they were markedly out of place were re-rated.[2]

After these modifications of the Thorndike-Lorge word frequency count, the procedure was then to rate every word which appeared in the type-token segments on a segment-by-segment basis. The decision to use the type-token segments was made for a very specific reason: any given word is counted one time and one time only, and as a result the *repetition* of words could not affect the result one way or another.[1]

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[1] Thorndike-Lorge, op. cit.

[2] This re-rating process was done on relatively few words. No attempt was made to re-rate any word unless it seemed notably out of place.

Tables 8a, 8b, 8c, and 8d present the data on height of vocabulary. As can be seen, the differences do not appear substantial: the high group appears to be superior to the low group, but not to a marked degree. However, this apparent lack of marked superiority on the part of the high group seems to be a result of too little language being studied at a time: i.e., trying to measure differences in height of vocabulary *within a given 100-word segment*.[2] On those years in which there are four successive 100-word segments which can be added together and then compared (grades five through nine), *the high group shows itself very superior on height of vocabulary*. These data, which were computed directly from Tables 8a, 8b, 8c, and 8d are shown in Table 9. In this table it can be seen that the high group has a higher median for *every* year and for *every* break-down whether it be common words or uncommon words. Thus it seems clear that when a sufficiently large amount of comparable language is studied, the high group shows its superiority on vocabulary not only by using more different words than the low group (greater diversity) but also by using a greater number of the less common words (greater height).

---

[1] Because the Thorndike-Lorge count was derived from written material, certain common childish spoken words in the oral transcripts of this study show an excessively high rating: *O.K.*, *bunny* (rabbit) are *not* among the most common words in Thorndike's study. Proper names, used often by members of both the low and high groups, fall into the least common category and are best omitted in such a study as this. (This procedure has been followed.) Some subjects in the low group are so weak in language power that they, like small children in the earliest stages of language, repeat over and over again the words they stumble upon to express themselves. Thus in a preliminary examination of the data, one subject who was exceptionally poor in language repeated *bunny* twelve or thirteen times, running his score on non-frequent words much higher than his fellow first-graders who had greater control over language. By tallying such compulsive language *only the first time it occurs*. the word-frequency count will reflect a truer picture.

[2] In any research study one often runs the risk of trying to break the data down to such a fine point that differences are actually obscured rather than clarified.

TABLE 8a

MEASUREMENT OF VOCABULARY HEIGHT FOR HIGH AND LOW GROUPS

Medians of Words in First 100-Word Type-Token Segment
Thorndike-Lorge Word Frequency Count
Grades Kindergarten through Nine
High N = 25 Low N = 25

Grade	500 Most Common		500 to 1000 Most Common		1000 to 2000 Most Common		2000 to 3000 Most Common		3000 to 4000 Most Common		Less Common Words	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Kindergarten	38	38	4	4	3	3	2	1	0	0	2	2
One	41	38	6	5	3	3	2	1	1	0	3	2
Two	40	40	5	5	2	3	2	1	1	1	2	2
Three	42	38	5	5	3	2	2	1	0	0	2	3
Four	43	36	4	5	3	2	2	1	1	1	3	1
Five	44	38	4	4	3	2	2	1	1	0	2	2
Six	44	40	4	4	3	2	2	1	1	0	2	2
Seven	45	40	4	4	3	2	1	1	1	0	3	2
Eight	44	41	5	4	3	2	2	1	1	1	3	1
Nine	46	41	4	4	4	2	2	1	1	1	2	2

TABLE 8b

MEASUREMENT OF VOCABULARY HEIGHT FOR HIGH AND LOW GROUPS

Medians of Words in Second 100-Word Type-Token Segment
Thorndike-Lorge Word Frequency Count
Grades Kindergarten through Nine
High N = 25 Low N = 25

	500 Most Common		500 to 1000 Most Common		1000 to 2000 Most Common		2000 to 3000 Most Common		3000 to 4000 Most Common		Less Common Words	
Grade[1]	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Four	27	28	5	4	3	2	1	1	1	0	2	2
Five	28	23	4	3	2	1	1	1	1	1	2	2
Six	27	23	4	4	2	2	1	1	1	0	2	0
Seven	27	23	5	4	3	3	1	0	0	0	3	1
Eight	29	24	4	4	3	3	1	1	1	0	1	1
Nine	27	25	4	4	4	3	1	1	1	0	2	1

---

[1] Grades kindergarten through three had no Second 100-word segments on which the two groups could be compared.

TABLE 8c

MEASUREMENT OF VOCABULARY HEIGHT FOR HIGH AND LOW GROUPS

Medians of Words in Third 100-Word Type-Token Segment
Thorndike-Lorge Word Frequency Count
Grades Kindergarten through Nine
High N = 25 Low N = 25

Grade[1]	500 Most Common		500 to 1000 Most Common		1000 to 2000 Most Common		2000 to 3000 Most Common		3000 to 4000 Most Common		Less Common Words	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Five	20	17	5	5	3	1	2	1	0	0	2	1
Six	23	17	4	2	3	1	1	0	1	0	2	1
Seven	24	19	3	2	2	2	1	0	1	1	2	2
Eight	23	21	5	4	3	2	1	2	1	0	2	2
Nine	24	19	5	4	2	2	1	1	1	1	2	1

---

[1] Grades kindergarten through four had no Third 100-word segments on which the two groups could be compared.

TABLE 8d

MEASUREMENT OF VOCABULARY HEIGHT FOR HIGH AND LOW GROUPS

Medians of Words in Fourth 100-Word Type-Token Segment
Thorndike-Lorge Word Frequency Count
Grades Kindergarten through Nine
High N = 25 Low N = 25

Grade[1]	500 Most Common		500 to 1000 Most Common		1000 to 2000 Most Common		2000 to 3000 Most Common		3000 to 4000 Most Common		Less Common Words	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Five	18	19	4	3	2	2	0	1	1	0	3	1
Six	20	16	4	4	3	1	1	1	0	0	2	1
Seven	18	17	4	3	2	2	1	0	0	0	2	1
Eight	19	14	5	3	3	1	1	0	0	0	2	1
Nine	17	16	4	3	3	2	1	1	1	0	2	1

---

[1] Grades kindergarten through four had no Fourth 100-word segment on which the two groups could be compared.

TABLE 9

MEASUREMENT OF VOCABULARY HEIGHT FOR HIGH AND LOW GROUPS

Medians of Words in First, Second, Third, and Fourth
100-Word Type-Token Segments Combined
Thorndike-Lorge Word Frequency Count
Grades Kindergarten through Nine
High N = 25 Low N = 25

	500 Most Common		500 to 1000 Most Common		1000 to 2000 Most Common		2000 to 3000 Most Common		3000 to 4000 Most Common		Less Common Words	
Grade[1]	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Five	110	97	17	15	10	6	5		3	1	9	6
Six	114	96	16	14	11	6	5	3	3	0	8	4
Seven	114	99	16	13	10	9	4	1	2	1	10	6
Eight	115	100	19	15	12	8	5	4	3	1	8	5
Nine	114	101	17	15	13	9	5	4	4	2	8	5

[1] Grades kindergarten through four did not have four 100-word segments which could be combined and then compared.

Whether or not mere amount of language contributes to fluency, or whether or not vocabulary contributes to fluency, further evidence of this fluency factor lies in the way oral language actually operates. In this study classifications of language style are based on the recorded voices of the subjects in the two groups, and in two of these classifications of oral language style, fluency is featured:

fluent, smooth	to	hesitant, faltering, labored
ready and full in response	to	meager and slow in response

To find out whether or not those subjects low or high in language ability tended to be different from the total group in respect to these two classifications, the investigation employed the chi-square test. Rather than assume the null hypothesis or to estimate theoretical frequencies, the investigator used the table of random numbers to select an equal number of subjects from the total sample. Those members from the total sample, selected thus at random, were then classified by the same methods used for the low and high groups, and the resulting scores were used to replace theoretical frequencies in the computation of chi-square.

In these classifications the high group is significantly more fluent than the total sample. However, their readiness of response does not prove to differ from the random group. The low group proves to be more hesitant than the rest of the subjects in this study, and they are somewhat more slow of response. The results need to be considered only tentative inasmuch as cells with less than six cases occur frequently among the results for the random group.[1]

---

[1] The statistics, not included here, are available from the writer.

SUMMARY ON FLUENCY

To summarize the evidence on fluency, these subjects, over a period of ten years, increase the amount of language they use in the same controlled situation and, by reducing the proportion and size of their mazes, gain an increase of smoothness in their expression. Those who are rated high on language ability appear to be superior to the total sample for fluency and readiness of response, and they use more words in each year of the study than do those low in language ability. The high group also has a larger, more varied, and more readily accessible vocabulary. These subjects reduce the incidence of their mazes by thirty-five per cent over the first four years and are also during these four years reducing the total number of words in mazes and the average number of words in mazes. The low group, on the other hand, despite the fact that it uses fewer words, is increasing the total number of words and average number of words in mazes over the same period (kindergarten through third grade), even though it is reducing the incidence of mazes by eighteen per cent. In grades four through nine, where the amount of language increases notably, the high group consistently has a smaller proportion of mazes and words in mazes than the low group and consistently uses fewer words per maze. Lastly, there is a significant tendency for all subjects in the sample to maintain a consistent relative position in the total group when fluency (as measured by the average number of words per communication unit) is measured from year to year.

It would appear that members of the low group experience more difficulty in using and controlling the patterns of English syntax and therefore involve themselves in more language tangles or mazes per volume of spoken language than do members of the high group. The mazes certainly reduce fluency, whatever the cause for mazes may be. The low group says less, has more difficulty in saying it, and has less vocabulary with which to express what it says.

EFFECTIVENESS AND CONTROL

Words and readiness with them are one part of power over language. but unless a speaker or writer imposes a purposeful order upon such fluency, his language is likely to be prolix drivel or chatter. Consequently the findings bearing upon effectiveness and control of language, presented in this section, are highly important to the purpose of this study. Evidence on effectiveness and control has been drawn together from a number of sources:

. . . ability to use and vary the structural patterns of English (First Level Analysis)
. . . dexterity in varying elements within the structural patterns (Second Level Analysis)
. . . ability to express tentative thinking by means of provisional or conditional statements
. . . competence with reading and writing
. . . coherence through the use of subordination
. . . coherence through the use of subordinating connectives
. . . coherence through control of mazes
. . . coherence of spoken style
. . . mastery of conventional usage and grammar

All in all, at least nine measures in this study will provide evidence on the subjects' effectiveness and control. Logically these measures provide a reasonably comprehensive description of language effectiveness and control.

1. First Level Analysis: Ability to Use and Vary the Structural Patterns of English

The subjects' oral language was analyzed for evidence on ability to use and vary the basic structural patterns of English. Each communication unit was classified and tallied as shown in Table 10. Because the high group used more language, the results in Table 10 have been computed in per cent of total amount of language in order to make the two groups comparable. The table yields the following evidence:

. . . The 1 2 pattern (Mary eats; Mary is home.) shows a steady increase from kindergarten through grade nine for both the high group and the low group. On this pattern the two groups seem almost identical.

. . . The 1 2 4 pattern (Mary eats strawberries.) increases steadily for the high group until a peak is reached in grade seven; the high group then diminishes to some degree. The low group also shows a persistent increase in this pattern but the incidence of use is usually somewhat lower than that of the high group.

. . . The 1 ② 5 pattern, which deals with the use of linking verbs (Strawberries are berries; Strawberries are good.), shows a higher incidence for the high group. Both groups double their use of this pattern over the period from kindergarten to grade nine, but the high group consistently uses this pattern to a greater extent than does the low group.

. . . The 1 2 3 4 pattern, the inner complement (Mary threw the dog some biscuits.), is seldom used by either group and appears not to be a frequent pattern in English, certainly not among children in this study. The incidence of use for this pattern is slightly more frequent for the high group from kindergarten through grade four. From grade five through grade nine, however, the low group first equals and then exceeds the high group.

. . . The 1 2 4 6 pattern, the outer complement (They elected Mary president; They thought Suzie conceited.), is also seldom used by either group. As in the case of the inner complement, the high group shows an earlier incidence of this pattern but later (grades seven and eight) is exceeded by the low group.

. . . The (1)②1 pattern (there is, here is, there are, here are) increases and then decreases for both groups. The high group, however, uses this pattern more frequently than does the low group through grade four. From grade five through grade nine both groups fluctuate but show approximately the same incidence.

. . . The WQ pattern (questions) shows almost no incidence for either group. Requests and commands also show no incidence and have not been presented in the table. However, it should be noted that the structure of the interview is such that these patterns would not ordinarily be elicited.

. . . The passive pattern (Strawberries were eaten by Mary.) is employed only slightly by either group from kindergarten through grade four although some subjects in both groups make use of this pattern in these earlier years as evidenced by the upper limit of the inter-quartile ranges.[1] From grade five through

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[1] The data shows that several subjects in the low group use the passive construction in kindergarten although the upper limit for their kindergarten inter-quartile range is zero.

> grade nine, however, the high group steadily increases its use of the passive construction, using passives three times as frequently in grade nine as in grade five. The low group begins using this pattern to a noticeable degree in grade six, but the incidence remains lower than that of the high group. . . . On the use of partial communication units (units that are incomplete, for whatever reason) the low group shows a much higher incidence than does the high group. For both groups the per cent of partials decreases with chronological age. However, with the exception of grade one, the low group consistently uses about ten per cent more partial constructions than does the high group.

From the data it seems clear that on most structural patterns of the English language the differences between the high group and the low group are not noticeable. However, in the use of the 1②5 pattern, the use of passives, and the lack of use of partials, the high group clearly demonstrates its superiority.[1]

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[1] An examination of the transcripts shows that some subjects in the high group know and use all nine patterns in kindergarten; no subjects in the low group give evidence of this ability.

TABLE 10

FIRST LEVEL ANALYSIS: RELATIVE PROPORTIONS OF STRUCTURAL PATTERNS ACCORDING TO PER CENT OF PATTERN USED IN TOTAL TRANSCRIPT

Median and Inter-quartile Range of High and Low Groups
Grades Kindergarten through Nine
High N = 25 Low N = 25

Grade	Pattern 1 2				Pattern 1 2 4				Pattern 1 ② 5			
	Median		Inter-quartile Range		Median		Inter-quartile Range		Median		Inter-quartile Range	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Kindergarten	19.7	20.2	16.2 to 26.7	12.5 to 25.3	28.8	21.7	21.6 to 32.1	12.5 to 30.0	9.2	6.5	6.9 to 15.0	3.6 to 10.6
One	19.9	22.1	11.5 to 24.3	14.2 to 32.3	31.3	24.3	27.4 to 39.3	13.9 to 37.0	14.5	8.1	8.8 to 17.8	3.3 to 11.6
Two	20.0	22.9	16.1 to 24.2	16.7 to 25.3	33.3	33.5	27.8 to 38.6	19.0 to 37.3	15.1	9.8	11.0 to 18.2	6.0 to 14.1
Three	22.7	22.1	17.0 to 27.7	19.2 to 25.2	36.2	28.7	31.0 to 39.4	21.9 to 36.7	15.9	10.4	9.4 to 20.5	6.4 to 14.1
Four	24.0	24.5	19.6 to 28.8	20.8 to 30.5	36.4	32.8	30.5 to 40.9	27.9 to 37.4	17.8	13.7	15.2 to 20.8	7.7 to 16.4
Five	26.6	23.5	21.8 to 28.3	18.0 to 29.8	36.2	32.1	31.4 to 39.4	28.9 to 37.0	13.9	10.9	12.1 to 21.1	8.9 to 13.2
Six	26.8	26.8	24.1 to 30.9	23.4 to 32.0	36.1	34.2	32.7 to 41.1	28.5 to 40.1	16.5	10.8	12.5 to 18.9	8.4 to 14.6
Seven	27.6	26.5	24.5 to 32.6	19.1 to 30.9	40.6	33.3	37.6 to 43.6	28.0 to 39.2	18.0	11.1	16.0 to 21.2	7.5 to 19.8
Eight	27.6	27.0	22.1 to 32.4	23.4 to 31.3	34.8	35.4	32.4 to 40.2	27.0 to 38.8	21.2	14.6	17.5 to 26.4	10.3 to 18.0
Nine	27.9	28.8	25.7 to 32.1	22.5 to 32.4	37.2	32.7	31.4 to 41.8	28.3 to 37.4	20.8	14.1	16.9 to 25.6	9.9 to 18.2

TABLE 10 (cont.)

FIRST LEVEL ANALYSIS: RELATIVE PROPORTIONS OF STRUCTURAL PATTERNS ACCORDING TO PER CENT OF PATTERN USED IN TOTAL TRANSCRIPT

Median and Inter-quartile Range of High and Low Groups
Grades Kindergarten through Nine
High N = 25 Low N = 25

Grade	Pattern 1 2 3 4				Pattern 1 2 4 6				Pattern (1) ② 1			
	Median		Inter-quartile Range		Median		Inter-quartile Range		Median		Inter-quartile Range	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Kinder-garten	0.6	0.0	0.0 to 1.1	0.0 to 1.4	0.0	0.0	0.0 to 0.8	0.0 to 0.0	3.6	0.0	2.3 to 5.8	0.0 to 0.7
One	0.0	0.0	0.0 to 1.2	0.0 to 1.0	0.0	0.0	0.0 to 1.0	0.0 to 0.0	3.8	0.6	1.1 to 9.1	0.0 to 3.4
Two	0.0	0.0	0.0 to 0.9	0.0 to 1.2	0.0	0.0	0.0 to 0.0	0.0 to 0.0	5.6	3.3	2.1 to 8.2	1.1 to 4.5
Three	0.4	0.0	0.0 to 1.3	0.0 to 1.9	0.0	0.0	0.0 to 0.6	0.0 to 1.0	5.3	3.0	2.7 to 7.3	1.2 to 5.5
Four	1.3	0.6	0.0 to 2.3	0.0 to 1.5	0.0	0.0	0.0 to 0.6	0.0 to 0.8	4.1	2.0	3.0 to 6.9	0.0 to 3.2
Five	1.1	1.1	0.5 to 1.8	0.0 to 2.2	0.0	0.0	0.0 to 0.8	0.0 to 0.6	3.3	3.1	1.8 to 5.1	1.4 to 9.1
Six	0.9	2.0	0.5 to 1.9	0.7 to 4.3	0.5	0.0	0.0 to 0.9	0.0 to 0.4	2.4	2.5	0.9 to 4.0	0.8 to 3.8
Seven	1.0	1.9	0.0 to 2.2	0.0 to 3.0	0.0	0.0	0.0 to 0.8	0.0 to 1.1	1.7	3.1	0.9 to 2.3	1.1 to 8.3
Eight	0.9	1.2	0.1 to 2.2	0.0 to 3.2	0.4	0.8	0.0 to 0.7	0.0 to 1.4	2.7	2.1	1.5 to 3.3	1.1 to 3.9
Nine	0.9	1.7	0.4 to 1.7	0.1 to 4.1	0.0	0.3	0.0 to 0.8	0.0 to 1.8	2.2	1.7	1.0 to 2.9	0.6 to 3.1

TABLE 10 (cont.)

FIRST LEVEL ANALYSIS: RELATIVE PROPORTIONS OF STRUCTURAL PATTERNS ACCORDING TO PER CENT OF PATTERN USED IN TOTAL TRANSCRIPT

Median and Inter-quartile Range of High and Low Groups
Grades Kindergarten through Nine
High N = 25 Low N = 25

	Pattern WQ				Pattern Passive				Pattern Partial			
	Median		Inter-quartile Range		Median		Inter-quartile Range		Median		Inter-quartile Range	
Grade	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Kindergarten	0.3	0.0	0.0 to 1.3	0.0 to 3.7	0.0	0.0	0.0 to 0.8	0.0 to 0.0	32.2	44.2	25.1 to 39.5	31.0 to 63.9
One	0.0	0.0	0.0 to 1.1	0.0 to 1.2	0.0	0.0	0.0 to 1.1	0.0 to 0.4	24.0	28.3	16.9 to 30.8	24.5 to 58.6
Two	0.0	0.0	0.0 to 1.0	0.0 to 1.2	0.0	0.0	0.0 to 1.0	0.0 to 1.3	21.8	30.3	15.7 to 27.9	20.5 to 49.5
Three	0.0	0.0	0.0 to 0.8	0.0 to 0.9	0.0	0.0	0.0 to 0.7	0.0 to 1.1	17.9	29.9	13.6 to 30.0	22.1 to 42.6
Four	0.0	0.0	0.0 to 0.9	0.0 to 0.0	0.0	0.0	0.0 to 1.6	0.0 to 1.1	12.2	22.7	10.2 to 17.1	18.0 to 29.8
Five	0.0	0.0	0.0 to 0.0	0.0 to 0.0	0.8	0.0	0.4 to 1.5	0.0 to 1.3	14.3	23.4	10.0 to 21.0	15.2 to 29.5
Six	0.0	0.0	0.0 to 0.6	0.0 to 0.0	0.9	0.8	0.0 to 1.6	0.0 to 1.7	11.4	19.2	9.1 to 17.8	11.4 to 28.1
Seven	0.0	0.0	0.0 to 0.8	0.0 to 0.6	2.0	0.6	1.1 to 3.2	0.0 to 1.3	5.4	15.3	3.5 to 8.3	9.6 to 25.5
Eight	0.0	0.0	0.0 to 0.7	0.0 to 1.0	2.5	1.2	1.5 to 3.8	0.1 to 1.8	5.7	12.5	4.2 to 9.1	8.0 to 21.1
Nine	0.0	0.0	0.0 to 0.7	0.0 to 1.1	2.9	0.6	1.1 to 4.2	0.0 to 2.2	6.2	14.6	4.0 to 9.3	9.5 to 23.3

Another method of analyzing the data on sentence patterns is to look at the number of subjects who show an ability to use a particular pattern rather than the degree (per cent) with which they use it--in other words, to simply count the number of subjects who use a given pattern one or more times in any given year. These data (Table 11) indicate that the majority of subjects, whether ranked high or low in language ability, do in fact learn to use the more uncommon sentence patterns.[1] However, substantially more subjects in the high group than in the low group are familiar with these uncommon patterns at an early age (kindergarten and grade one). The phenomenon seems to be one of the high groups starting out two years ahead of the low group and then having the school system bring the two groups closer together.[2]

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[1] Those patterns showing a high median percentage (those used even at the kindergarten level by virtually every subject) have not been shown in Table 11. In addition, those patterns which the interview would not ordinarily elicit have been ignored.

[2] The use of the passive construction during grades seven, eight, and nine seems to differentiate well between the high and low groups, and this trend will be carefully followed during subsequent years of the research.

TABLE 11

NUMBER OF SUBJECTS IN HIGH AND LOW GROUPS ACTUALLY USING THE MORE UNCOMMON SENTENCE PATTERNS IN ORAL INTERVIEWS[1]

Grades Kindergarten through Nine
High N = 25 Low N = 25

Grade	Pattern 1 2 3 4 High Group	Pattern 1 2 3 4 Low Group	Pattern 1 2 4 6 High Group	Pattern 1 2 4 6 Low Group	Pattern (1) ② 1 High Group	Pattern (1) ② 1 Low Group	Pattern Passive High Group	Pattern Passive Low Group
Kindergarten	14	10	10	4	23	8	6	3
One	11	7	9	2	23	12	9	5
Two	10	10	3	5	24	18	9	10
Three	13	11	9	7	25	22	8	9
Four	17	12	9	8	25	17	11	9
Five	21	16	10	7	24	21	20	11
Six	21	21	15	6	22	20	16	15
Seven	18	18	9	11	23	22	22	14
Eight	19	18	13	17	24	21	25	19
Nine	20	19	11	13	23	21	23	15

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[1] The high and low groups each had twenty-five subjects during the period from kindergarten through grade nine. Table 11 indicates how many of the twenty-five subjects in each group used the particular pattern one or more times.

2. Second Level Analysis: Dexterity in Varying Elements within the Structural Patterns

All these subjects--high, random, and low--use the relatively few structural patterns of the English language. Thus structural pattern reveals less remarkable differences than does dexterity of substitution within the patterns. The important differences show up in the substitution of word groups for single words, in the choice and arrangement of movable syntactic elements, in variety of nominals, and in strategies with predication. Here the subjects' differences are much greater, as may be seen in Tables 12, 13, and 14.

Movables

Essential sentence elements, those determining the structural patterns in the First Level Analysis, occupy fixed positions. In English, word order determines meaning. English speakers can say Mary ate the rhubarb (1 2 4), but they cannot say The rhubarb ate Mary and make sense. Even in poetic inversion they risk misunderstanding. English has no 4 2 1 pattern. The essential sentence elements, then, have a fixed order in our language.

There are, however, some less essential elements which are relatively unfixed, adverbial modifiers like usually, in the meantime, and if you don't really like it. In this study these have been classified as words, phrases, clauses, and multiple movable constructions (movables within movables such as holding the clowns in his hands or whoever in the excitement manages to keep from laughing). The high and low groups show little difference in the use of words and phrases as movables, but as will be seen by their medians in Table 12, the high group consistently shows a greater repertoire of clauses and multiples used as movable elements in the sentence. In order to make direct comparison possible between the two groups, the number of movable elements in their transcripts has been converted to per cent of totals.

TABLE 12

DEXTERITY IN VARYING ELEMENTS WITHIN STRUCTURAL PATTERNS: MOVABLES

Medians of Various Movables Used by High and Low Groups
Grades Kindergarten through Six
High N = 25 Low N = 24

Grade	Group	Words	Phrases	Clauses	Multiples
Kinder-garten	High	36.2	45.3	9.9	5.0
	Low	34.6	54.3	5.9	0.0
One	High	35.7	47.6	9.6	3.0
	Low	39.5	47.8	6.1	0.0
Two	High	36.1	49.4	12.7	4.4
	Low	41.6	45.9	7.0	0.6
Three	High	41.3	45.1	10.2	3.1
	Low	37.6	48.4	10.7	2.0
Four	High	34.7	47.8	11.3	5.1
	Low	38.6	47.7	5.0	2.2
Five	High	35.9	47.4	11.1	4.7
	Low	38.2	46.9	9.8	3.2
Six	High	37.0	49.4	10.7	4.6
	Low	37.9	48.0	3.8	3.3

Nominals Used as Subjects

As can be seen in Table 13, the high and low groups use nouns (including noun-headed nominal phrases) and pronouns almost exclusively for sentence subjects, and both groups do so in about the same proportions. The medians for both groups do not, however, reveal the fact that the high group exceeds the low group in the number of more complicated constructions used as subjects. The following shows what happens when complicated constructions are tallied:

	High	Low
Verbals	13	1
Infinitives	18	3
Prepositional phrases	5	4
Clauses	28	0
Total	64	8

In the low group, during the years from kindergarten through grade six, there occur only eight instances of subject nominals more complicated than a noun, pronoun, or noun-headed nominal phrase. Of these eight, half are prepositional phrases and none are clauses. The boys in the low group contributed only two of the eight instances (two infinitives).

TABLE 13

DEXTERITY IN VARYING ELEMENTS WITHIN STRUCTURAL PATTERNS: NOMINALS USED AS SUBJECTS

Medians of Various Nominals Used by High and Low Groups
Grades Kindergarten through Six
High N = 25 Low N = 24

Grade	Group	Nouns	Pronouns	Verbals	Infinitives	Prep. Phrases	Clauses
Kinder-garten	High	18.8	80.8	0	0	0	0
	Low	18.8	81.2	0	0	0	0
One	High	23.7	76.0	0	0	0	0
	Low	25.8	74.2	0	0	0	0
Two	High	22.5	77.5	0	0	0	0
	Low	24.0	76.0	0	0	0	0
Three	High	23.2	76.8	0	0	0	0
	Low	26.0	74.0	0	0	0	
Four	High	18.6	81.4	0	0	0	0
	Low	23.1	76.9	0	0	0	0
Five	High	17.7	81.3	0	0	0	0
	Low	27.4	72.6	0	0	0	0
Six	High	24.2	75.5	0	0	0	0
	Low	23.2	76.8	0	0	0	0

Nominals Used as Complements

For nominals used as complements the same situation develops. Both groups, as can be seen in Table 14, use nouns, noun-headed nominal phrases, and pronouns as complements with about the same frequency. The difference lies in the use of infinitives and clauses where the high group invariably exceeds the low group.

Because many subjects do not use verbals or prepositional phrases as complements, the median again does not reveal any differences. However, the actual incidences occurring in the two groups for seven years do differ as follows:

	High		Low	
	boys	girls	boys	girls
Verbals	39	49	19	34
Prepositional phrases	57	22	14	26
Total	96	71	33	60
Total (boys and girls)	167		93	

The boys in the low group are the ones who have the smallest repertoire, the least dexterity. Also, in the high group there is the interesting phenomenon of the boys exceeding the girls.

Nominals Used as Objects of Prepositions and Verbals

As in the previous analyses, the high group exceeds the low group in using any form of nominal except the single noun or pronoun. Nouns amplified by modifiers, compound nouns, clauses, infinitives--all these characterize the high group rather than the low group. Once again the high boys manifest slightly greater flexibility than the high girls, and the low boys are more restricted in their repertoires than are the low girls.

TABLE 14

DEXTERITY IN VARYING ELEMENTS WITHIN STRUCTURAL PATTERNS: NOMINALS USED AS COMPLEMENTS[1]

Medians of Various Nominals Used by High and Low Groups
Grades Kindergarten through Six
High N = 25 Low N = 24

Grade	Group	Nouns	Pronouns	Verbals	Infinitives	Prep. Phrases	Clauses
Kinder-garten	High	58.6	22.0	0	9.0	0	8.3
	Low	53.6	29.6	0	4.2	0	2.8
One	High	62.4	19.0	0	5.7	0	8.0
	Low	67.8	17.8	0	3.6	0	4.7
Two	High	59.6	21.8	0	8.1	0	11.1
	Low	60.8	24.6	0	5.2	0	5.4
Three	High	56.5	21.7	0	9.5	0	10.4
	Low	65.5	22.1	0	4.7	0	7.3
Four	High	50.7	23.1	0	9.0	0	12.7
	Low	58.1	24.0	0	6.5	0	7.4
Five	High	50.8	22.3	0	10.8	0	13.1
	Low	54.0	25.2	0	8.4	0	7.2
Six	High	51.9	22.6	0	11.6	0	12.8
	Low	50.6	24.3	0	9.6	0	8.8

---

[1] Complements tallied represent direct and indirect objects, predicate nominatives, and object complements.

3. Ability to Express Tentative Thinking by Means of Provisional and Conditional Statements

Ineptness with language is far less serious than malicious perjury or slander, no matter how skillfully or beautifully phrased. The purposes for which human beings use language deserve study. For children's language, as for all language, function is still relatively uncharted. Piaget's disputed analysis of function finds children's language to be primarily egocentric before age seven or eight and more social and analytical in nature after age eleven or twelve. Rugg and others evolved a different set of functional categories: linguistic experimentation, perceptions, self-assertion, and statements of fact, among the most common.[1] Other experimenters have noted requests, threats, criticism, commands, and questions. In the present study expression of tentativeness proved to be a function of language which distinguished effective and ineffective users of language. Apparently the functions of language are varied and numerous, even in childhood.

Results of all research into function of language depend upon the situation from which language samples are derived. Only when two language investigations sample similar situations will their classification of function be comparable. This points up a limitation of all research into language, including the present study. Until comprehensive long-range research into children's language can be financed or devised, we cannot sample the same subjects over a long-range dimension of time nor can we record samples of the subjects' language in a wide variety of situations. In the present research, the language sample was secured in an interview situation identical for all subjects. In such a context, opportunities for such functions as threats, commands, or deception are negligible. In another situation, the findings on vocabulary, usage, and style might differ considerably; certainly the functions of language would vary.

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[1] H. Rugg, L. Krueger, and A. Sondergaard, *op. cit.*, p. 9.

Despite the limitations expressed above, the analysis of linguistic function in this research does reveal one fact of considerable import. Those subjects who proved to have the greatest power over language--by every measure that could be applied, not just by the combined Teachers' Rating Scale and Vocabulary Test--were _the subjects who most frequently used language to express tentativeness_. Supposition, hypotheses, and conditional statements occur much less frequently in the language of subjects lacking skill in language.

The low group furnishes only a few examples of this use of language whereas the high group uses language in this way from the kindergarten year through the sixth grade, employing such words as _perhaps_ and _maybe_ more often than do the subjects who have difficulty in expressing themselves. These most capable speakers often use such expressions as the following:

> It might be a gopher, but I'm not sure.
>
> That, I _think_, is in Africa.
>
> But maybe they don't have any dogs in Alaska.
>
> I'm not exactly sure where that is. It looks like it might be at school.
>
> That's white grass--unless there's snow or the sun is reflecting.

The child with less power over language appears to be less flexible in his thinking, is not often capable of seeing more than one alternative, and apparently summons up all his linguistic resources merely to make a flat dogmatic statement.

In addition to the findings on tentativeness, Table 15 shows that relatively few examples of generalization or figurative language appear in the language of these subjects. The situation from which the language samples were drawn was one in which generalization was entirely possible. Equally surprising is the scarcity of figurative language. A few subjects in the high group and in the total group noted that the rounded top of a fence looked like little hills or that a girl about to cry had a face that was clouding up. Yet the situation from which these language samples were drawn offered, it was believed, exceptionally good opportunity for subjects to use figurative language as well as generalizations.

TABLE 15

FUNCTIONS OF LANGUAGE: CLASSIFICATION OF LOW AND HIGH GROUPS IN EIGHT CATEGORIES OF LANGUAGE FUNCTION[1]

Grades Three, Four, Five, and Six
High N = 25 Low N = 24

Functions of Language in a Sample Drawn From Oral Interview	Grade								Total for Four Years	
	Three		Four		Five		Six			
	High	Low	High	Low	High	Low	High	Low	High	Low
Statement of Facts, Perceptions	43	23	48	25	49	34	52	46	192	128
Interpretations	26	17	21	16	19	19	34	24	100	76
Personal Associations	16	0	17	10	19	11	21	13	73	34
Tentative Statements	28	3	31	5	49	7	51	12	159	27
Generalizations	2	0	8	3	13	5	15	7	38	15
Irrelevancies	2	8	7	9	4	9	0	8	13	34
Questions	5	1	3	7	2	3	4	5	14	16
Figurative Language	5	0	12	3	11	0	13	5	41	8

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[1] Figures represent averages for each group. The sample was composed of seventy communication units drawn from the answer on television and on the six pictures for grades three, four, five, and six. The incidence of each function was tallied and averages (means) computed. However, incidences in proportion to amount of language would be an improvement of this present classification.

4. Competence with Reading and Writing

Methods of appraising competence in reading and writing were also a part of this research.

Reading

Beginning in grade four and continuing through grade nine, the Stanford and California Achievement Tests in Reading were administered.[1] Table 16 presents these data for the high, low, and total group of subjects and Figure 6 graphically presents grades four, six, and eight.[2]

When examining the medians in Table 16, the differences between the groups become immediately obvious. The high group always reads more than two years above its chronological age; the low group starts by reading one and a half years below its chronological age and falls further and further behind with each successive year; the total group is reading very close to the expected age norm.[3]

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[1] Evidence on the recreational reading of the subjects has been collected for grades four through nine but has not yet been studied.

[2] Data have been gathered and analyzed for grade nine, but N for the high and low groups is too low to be representative.

[3] In a sample of the entire population one would expect the median subject to read at the 0-0 level; i.e., to have the difference between his chronological age and his reading achievement age approximately zero. In this research the median for the total group is very close to what one would expect from the population as a whole and is another indication that the sample is a representative one.

TABLE 16

COMPARISON OF SCORES ON READING ACHIEVEMENT USING STANFORD AND CALIFORNIA READING ACHIEVEMENT TESTS[1]

High, Low, and Total Group of Subjects
Grades Four through Eight[2]

	Median			Inter-quartile Range			Total Range		
Grade	High Group	Total Group	Low Group	High Group	Total Group	Low Group	High Group	Total Group	Low Group
Four	+2-6	0-0	-1-6	+1-1 to +3-3	-1-1 to +1-7	-0-3 to -2-9	-0-1 to +3-8	-3-5 to +3-8	+0-2 to -3-1
Five	+3-1	+0-6	-1-11	+2-0 to +4-3	-1-2 to +2-2	-1-2 to -2-11	-0-7 to +5-2	-4-0 to +5-2	+1-3 to -4-0
Six	+3-8	+0-6	-2-2	+1-10 to +4-4	-1-6 to +2-2	-1-9 to -3-4	-0-11 to +4-9	-5-0 to +4-9	+2-4 to -5-0
Seven	+3-2	+0-3	-2-8	+2-0 to +3-6	-2-1 to +2-6	-1-9 to -4-6	+0-4 to +3-8	-5-6 to +4-4	+1-1 to -5-6
Eight	+2-4	+0-6	-3-0	+2-2 to +2-6	-2-2 to +2-3	-1-2 to -4-11	0-0 to +2-7	-6-1 to +3-1	-0-9 to -6-1

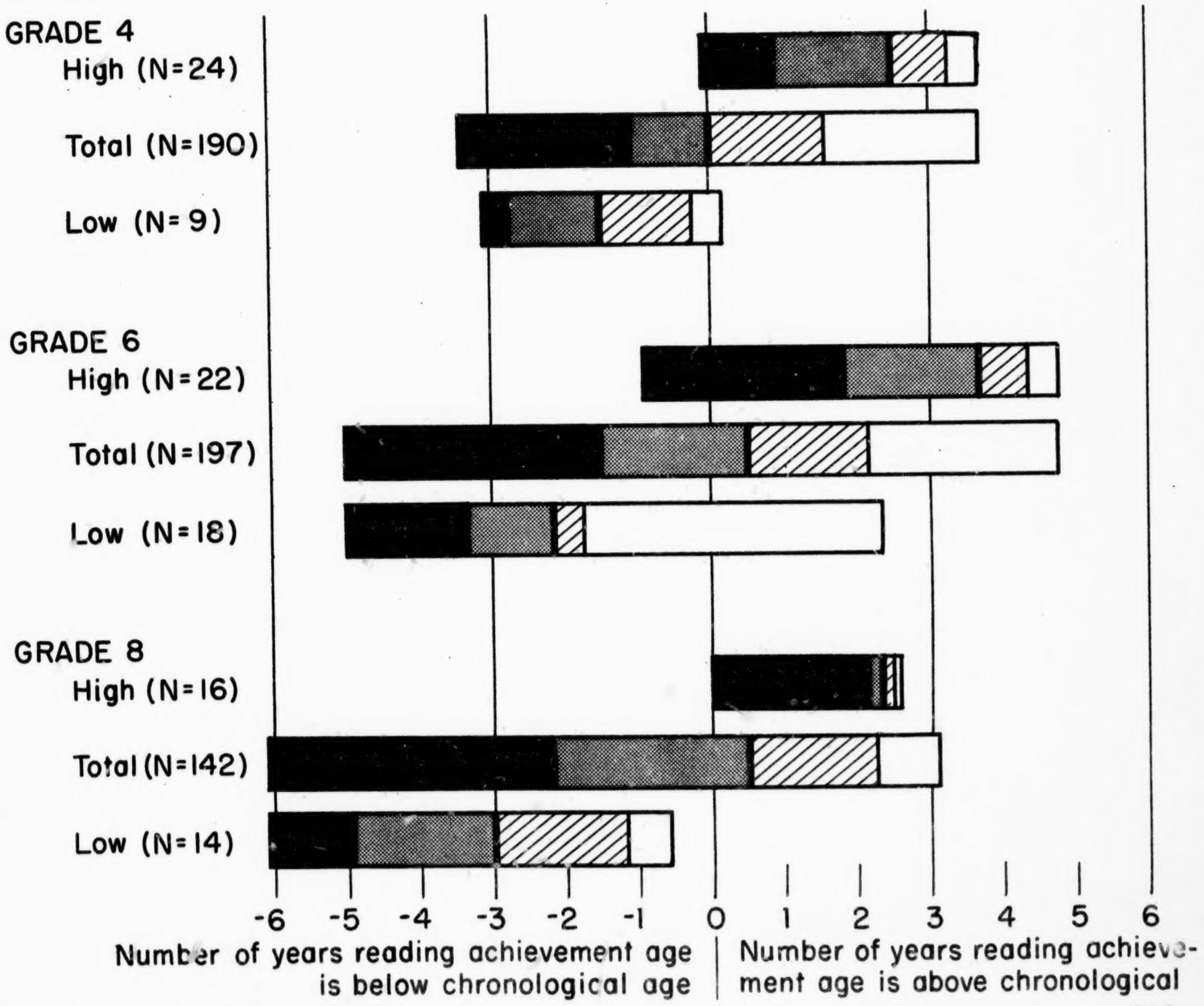
[1] Reading achievement scores are shown in years and months above or below chronological age (indicated by plus or minus). The dash between the numbers separates years and months. For example, the inter-quartile range for the total group in grade four should be read as one year and one month below chronological age (indicated by minus sign) to one year and seven months above chronological age (indicated by plus sign).

[2] Data on reading achievement for grade nine has also been gathered and analyzed, but N for the high and low groups was too low to be representative. For grades four through eight N also varies because reading achievement tests are not administered to all subjects for every year. The N's are typically about twenty for the high group, seventeen for the low group, and 175 for the total group.

FIGURE 6

COMPARISON OF SCORES ON READING ACHIEVEMENT
USING STANFORD AND CALIFORNIA READING ACHIEVEMENT TESTS

High, Low, and Total Group of Subjects
Grades Four, Six, and Eight



Wide band indicates median; quartiles are indicated by cross hatch

One feature of the medians which at first seems puzzling is that the high group reaches a peak in grade six and then declines. However, this is not evidence that the high groups' reading ability has declined; it is a result of the way in which the Stanford Reading Achievement Test is designed. The maximum score on the test is a reading achievement age of sixteen years. In other words a subject who is actually thirteen years old could not possibly score higher than three years above his chronological age. Therefore, as good readers approach a chronological age of sixteen the value of the test grows progressively less as a means of differentiating among them.[1] On the other hand, as poor readers approach the age of sixteen, reading tests become progressively more valid as a means of differentiating among them; the range of possible minus scores grows larger as chronological age increases.

The inter-quartile range also shows a marked difference for the high and low groups. (See Table 16.) The central fifty per cent of subjects in the high group always read more than one year above their chronological age, whereas the central fifty per cent of the subjects in the low group always read significantly below their chronological age. The picture for the total range does not, at first, seem quite so clear since the high group does show some minus signs and the low group shows some plus signs. However, this phenomenon is a result of one subject in the high group not being a good reader and one subject in the low group reading above his reading age.[1]

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[1] The way in which the test causes the high group to bunch together can be seen in grade eight (Figure 6). Three of the quartiles (seventy-five per cent of the subjects in the high group) are so close together as to be barely distinguishable on the graph.

The effect of socio-economic status on reading ability is also of considerable interest and these data are shown in Table 17. When studying this table, the decline in the medians as one goes down the socio-economic rankings is particularly striking. And even more striking is that without exception the median for socio-economic groups V, VI, and VII is minus whereas for those of higher socio-economic status the median is plus.

The inter-quartile range also shows a striking phenomenon. For those of high socio-economic status the central fifty per cent of the subjects almost invariably read above their chronological age; for those of low socio-economic status the central fifty per cent of the subjects have precisely the opposite pattern, always reading below their chronological age. The total range indicates that some subjects of low socio-economic status are good readers and some subjects of high socio-economic status are poor readers. However, these cases are relatively infrequent.

In conclusion, it seems clear that there is not only a marked difference between the reading ability of those ranked high and low by teachers' ratings on non-reading factors but also a marked difference in reading ability along socio-economic lines. Those who have the advantage of good oral proficiency (and who come from good socio-economic circumstances) accelerate their reading ability as schooling progresses. Those whose social background offers them a limited linguistic start in school fall further behind as reading instruction continues. Apparently reading instruction has a greater impact upon children whose oral language ability and social circumstances are high.

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[1] As previously indicated, the high and low groups were selected on a basis of ten-year averages of teachers' ratings (oral language ratings). In analyzing any given segment of data there apparently will always be a few subjects who do not quite fit the overall picture.

TABLE 17

SOCIO-ECONOMIC COMPARISON OF TOTAL GROUP OF SUBJECTS ON READING ACHIEVEMENT ABOVE OR BELOW CHRONOLOGICAL AGE[1]

Grades Four through Nine[2]

	Median Socio-Economic Status							Inter-quartile Range Socio-Economic Status							Total Range Socio-Economic Status						
Grade	I	II	III	IV	V	VI	VII	I	II	III	IV	V	VI	VII	I	II	III	IV	V	VI	VII
Four	+2-2	+1-2	+0-11	+0-4	-0-7	-1-2	-1-3	+0-9 to +3-1	-0-2 to +2-3	-0-2 to +1-6	-0-10 to +1-3	-1-6 to +0-3	0-0 to -2-6	0-0 to -2-1	-1-7 to +3-8	-2-11 to +4-5	-2-5 to +3-3	-2-3 to +2-4	-3-0 to +3-1	-3-5 to +2-0	-3-1 to +0-10
Five	+2-8	+1-4	+1-8	+0-7	-0-8	-1-6	-1-4	+1-4 to +3-3	+0-4 to +2-4	0-0 to +2-7	-0-10 to +2-2	-1-6 to +0-9	-0-6 to -2-5	-0-6 to -2-0	-1-3 to +5-3	-2-1 to +4-5	-2-3 to +3-9	-1-11 to +3-0	-4-0 to +4-3	-3-5 to +1-6	-2-11 to +1-4
Six	+3-2	+1-11	+1-6	+0-10	-0-11	-2-2	-1-5	+2-1 to +4-0	+0-3 to +3-3	0-0 to +3-3	-0-10 to +1-7	-2-0 to +1-1	-0-7 to -2-9	0-0 to -2-0	-1-0 to +4-9	-5-0 to +4-9	-2-5 to +4-7	-2-3 to +3-8	-3-7 to +4-4	-3-11 to +2-5	-2-8 to +1-7
Seven	+3-1	+2-4	+1-11	+0-10	-1-3	-2-7	-1-9	+1-11 to +3-6	+1-1 to +3-1	+0-2 to +3-2	-0-9 to +3-0	-2-8 to +1-1	-0-6 to -3-6	+0-2 to -2-4	-0-9 to +4-6	-2-2 to +4-0	-3-0 to +4-10	-3-10 to +3-6	-5-3 to +3-3	-5-6 to +3-3	-3-2 to +0-11
Eight	+2-3	+2-2	+2-2	+0-2	-1-2	-1-11	-1-11	+1-9 to +2-5	+0-7 to +2-6	+0-6 to +2-4	-2-4 to +1-9	-3-4 to +1-6	-0-6 to -3-6	+0-10 to -2-11	+1-6 to +2-7	-1-4 to +2-10	-1-9 to +3-1	-3-6 to +2-4	-6-1 to +2-6	-5-6 to +2-4	-3-9 to +2-0
Nine	--	+1-4	+1-2	+0-5	-1-2	-2-0	-2-4	--	+0-1 to +1-8	-0-1 to +1-6	-1-7 to +1-4	-3-0 to +1-5	-0-9 to -3-9	0-0 to -3-8	--	-0-11 to +2-0	-1-0 to +2-3	-4-5 to +1-6	-6-0 to +3-10	-4-11 to +1-2	-6-7 to +1-2

[1] Reading achievement scores are shown in years and months above or below chronological age (indicated by plus or minus). The dash between the numbers separates years and months. For example, the total range for socio-economic status VII in grade four should be read as three years and one month below chronological age (indicated by minus sign) to zero years and ten months above chronological age (indicated by plus sign).

[2] N for socio-economic status I for grade nine was too low to be representative. For all socio-economic groups the N's vary from year to year because a reading achievement test is not administered to all students for every year. For the socio-economic groups shown, the N's are typically as follows: I = 25; II = 35; III = 30; IV = 20; V = 40; VI = 30; VII = 17.

Writing

In grade three, the first samples of the subjects' writing were collected and evaluated by an index of writing ability. In grades four through nine a more carefully refined code and scale was developed from the index used in grade three. This refined scale has ten steps and the papers are rated on a five-point basis. For example a score of nine or ten receives a rating of I (Superior) whereas a score of one or two receives a rating of V (Illiterate).[1]

Table 18 shows a percentage breakdown of the compositions as well as the actual number of compositions for the high, low, and total group. From the percentage relationships it seems clear that in grades four, five, and six the high group far exceeds the low group on writing ability, showing approximately 80 per cent of its writing to be Superior or High Average to the low group's 5 per cent in these two categories. In grades seven, eight, and nine the high group's superiority is still clearly marked with only 2.7 per cent of the high group having writing scores under the rating of High Average to the low group's 85.3 per cent. As expected, the total group falls between the high and low groups.[2]

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[1] Two judges rate each individual composition. In cases of one point disagreement, the lower category is taken; in cases of two point disagreement, the intervening category is taken; in cases of more than two point disagreement, a third reader is used. The readers seldom varied widely in ratings; less than two per cent of the papers were submitted to a third reader.

[2] Three-year groupings were used in order to show the trend of writing ability during the intermediate years of elementary school and to compare this to the level of writing during junior high school.

TABLE 18

RATINGS OF WRITTEN LANGUAGE

High, Low, and Total Group of Subjects
Grades Four through Nine

Number of Compositions Rated[1]

Writing Score	Grades Four, Five, and Six (combined) Total Group	High Group	Low Group	Grades Seven, Eight, and Nine (combined) Total Group	High Group	Low Group
I Superior	34	15	0	78	27	0
II High Average	261	43	4	331	46	11
III Low Average	296	14	23	223	2	38
IV Marginal	100	1	30	38	0	22
V Illiterate	32	0	18	4	0	4
Total	723	73	75	674	75	75

Number of Compositions Rated in Per Cent

Writing Score	Grades Four, Five, and Six (combined) Total Group	High Group	Low Group	Grades Seven, Eight, and Nine (combined) Total Group	High Group	Low Group
I Superior	4.7	20.5	0.0	11.6	36.0	0.0
II High Average	36.1	58.9	5.3	49.1	61.3	14.7
III Low Average	40.9	19.2	30.7	33.0	2.7	50.7
IV Marginal	13.9	1.4	40.0	5.7	0.0	29.3
V Illiterate	4.4	0.0	24.0	0.6	0.0	5.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

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[1] Note that each column is a three-year grouping. N for the high and low groups is twenty-five, and thus for each three-year period a total of approximately seventy-five compositions has been secured for each of these groups. The approximate N for the total group can be determined by simply dividing the given number by three. For example a total of 723 compositions were rated for the total group in grades four, five, and six combined. Thus an average of 241 compositions was secured in each of these years (723/3 = 241).

An examination of the socio-economic status of the subjects as it relates to their writing ability is of considerable interest, and these findings are shown in Table 19. From the percentage relationships shown at the bottom half of this table, it is quite evident that those of high socio-economic status typically write well; those of low socio-economic status write poorly. As in all phenomena dealing with individuals there are, of course, exceptions to the general rule. High socio-economic status alone does not guarantee one's writing ability, and it can be seen that in grades four through nine, out of a total of 155 compositions for socio-economic status I, a total of two were ranked as Marginal. On the other hand, from grades four through nine there were a total of 374 compositions from socio-economic groups VI and VII. And of these 374 compositions only two were ranked as Superior.

TABLE 19

SOCIO-ECONOMIC COMPARISON OF TOTAL GROUP OF SUBJECTS ON RATINGS OF WRITTEN LANGUAGE

Grades Four through Nine

Number of Compositions Rated

Writing Score	Grades Four, Five, and Six (combined) Total Papers	Socio-Economic Status I	II	III	IV	V	VI	VII	Grades Seven, Eight, and Nine (combined) Total Papers	Socio-Economic Status I	II	III	IV	V	VI	VII
I Superior	34	9	9	10	1	4	1	0	78	20	24	15	10	8	1	0
II High Average	261	49	55	52	29	44	23	9	331	48	58	63	32	61	44	25
III Low Average	296	19	46	46	35	56	58	36	223	8	19	22	23	53	66	32
IV Marginal	100	2	7	8	4	33	38	8	38	0	3	2	1	15	17	0
V Illiterate	32	0	3	1	1	12	12	3	4	0	2	0	0	1	1	0
Total	723	79	120	117	70	149	132	56	674	76	106	102	66	138	129	57

Number of Compositions Rated in Per Cent

Writing Score	Grades Four, Five, and Six (combined) Socio-Economic Status I	II	III	IV	V	VI	VII	Grades Seven, Eight, and Nine (combined) Socio-Economic Status I	II	III	IV	V	VI	VII
I Superior	11.4	7.5	8.6	1.4	2.7	0.8	0.0	26.3	22.7	14.7	15.2	5.8	0.8	0.0
II High Average	62.0	45.9	44.4	41.5	29.5	17.4	16.1	63.2	54.7	61.7	48.5	44.2	34.1	43.9
III Low Average	24.1	38.3	39.3	50.0	37.6	43.9	64.3	10.5	17.9	21.6	34.8	38.4	51.1	56.1
IV Marginal	2.5	5.8	6.8	5.7	22.1	28.8	14.3	0.0	2.8	2.0	1.5	10.9	13.2	0.0
V Illiterate	0.0	2.5	0.9	1.4	8.1	9.1	5.3	0.0	1.9	0.0	0.0	0.7	0.8	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

An analysis of sentence patterns in oral language was presented earlier which indicated that those ranked high in language ability tended to use more passive constructions, more 1②5 constructions,[1] and fewer partials. This same type of sentence pattern analysis has been applied to the written language of the subjects, and these data are presented in Table 20. As can be seen in Table 20, three patterns are used a great deal by both groups.[2] The high group does seem to use more of the uncommon sentence patterns in grades seven, eight, and nine than does the low group as well as *fewer* partials, but the differences between the groups do not seem particularly large. However, if we look at the *number* of subjects who use a given pattern rather than the amount (percentage volume) with which they use it, the differences between the groups become more striking (Table 21). In this table it seems apparent that more members of the high group make use of the uncommon sentence patterns, particularly *passives* and *questions*, than do members of the low group. The phenomenon seems to be not one of volume but one of moderate use; the high group tends to sprinkle its written language with uncommon sentence patterns whereas the low group stays more rigidly within the more simple sentence patterns.

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[1] Subject-verb-predicate adjective or predicate nominative.

[2] Patterns 1 2, 1 2 4, and 1②5.

TABLE 20

FIRST LEVEL ANALYSIS: RELATIVE PROPORTIONS OF STRUCTURAL PATTERNS ACCORDING TO PER CENT OF PATTERN USED IN WRITTEN LANGUAGE

Median and Inter-quartile Range of High and Low Groups
Grades Four through Nine[1]
High N = 25 Low N = 25

Grade	Pattern 1 2				Pattern 1 2 4				Pattern 1 ② 5			
	Median		Inter-quartile Range		Median		Inter-quartile Range		Median		Inter-quartile Range	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Four-Six	31.2	36.4	23.3 to 35.1	20.7 to 50.0	39.4	35.7	34.1 to 54.3	12.5 to 50.0	16.2	7.7	9.3 to 23.6	0.0 to 19.6
Seven-Nine	30.8	37.5	26.1 to 40.6	30.6 to 43.9	35.0	33.3	26.6 to 40.3	18.9 to 38.5	19.3	15.8	12.2 to 23.8	7.5 to 22.6

Grade	Pattern 1 2 3 4				Pattern 1 2 4 6				Pattern (1) ② 1			
	Median		Inter-quartile Range		Median		Inter-quartile Range		Median		Inter-quartile Range	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Four-Six	0.0	0.0	0.0 to 4.4	0.0 to 0.0	0.0	0.0	0.0 to 1.7	0.0 to 0.0	4.0	0.0	0.0 to 8.5	0.0 to 10.9
Seven-Nine	1.4	0.0	0.0 to 2.3	0.0 to 2.9	0.0	0.0	0.0 to 1.0	0.0 to 0.0	1.6	2.9	0.0 to 3.1	0.0 to 7.6

Grade	Pattern WQ				Pattern Passive				Pattern Partial			
	Median		Inter-quartile Range		Median		Inter-quartile Range		Median		Inter-quartile Range	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Four-Six	0.0	0.0	0.0 to 0.0	0.0 to 0.0	0.0	0.0	0.0 to 0.0	0.0 to 0.0	0.0	0.0	0.0 to 1.7	0.0 to 0.0
Seven-Nine	1.8	0.0	0.0 to 6.9	0.0 to 0.0	1.4	0.0	0.0 to 2.8	0.0 to 1.6	0.0	2.9	0.0 to 1.9	0.0 to 8.0

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[1] Grades four, five, and six combined; grades seven, eight, and nine combined.

TABLE 21

NUMBER OF SUBJECTS IN HIGH AND LOW GROUPS ACTUALLY USING THE MORE UNCOMMON SENTENCE PATTERNS IN WRITTEN LANGUAGE[1]

Grades Four through Nine

Pattern	Grades Four, Five, and Six (combined)		Grades Seven, Eight, and Nine (combined)	
	High	Low	High	Low
1②5	25	15	25	23
1 2 3 4	10	3	14	9
1 2 4 6	6	1	6	3
(1)②1	16	12	14	18
Questions	3	2	16	3
Passive	4	0	14	6

---

[1] The high and low groups each had twenty-five subjects during the period from kindergarten through grade nine. Note that grades four, five, and six have been combined as have grades seven, eight, and nine. Thus each subject had three opportunities to show a particular pattern in each of these combined sets of grades.

5. Coherence through the Use of Subordination

Effective use of language is more than uttering whatever perceptions or thoughts rise by chance to the surface of expression. The content of effective expression requires organization. In terms of purpose and communicability, the speaker or writer must discriminate among all the materials of expression. Like a good stage director, he must work behind the scenes, rapidly placing related materials together, selecting or repressing, providing that all-important logical consecutiveness which enables discourse to "hang together." This implies, also, experience to avoid pitfalls, to note and to consolidate the successes one has had. This variation in coherence is illustrated in the transcripts of two different first grade subjects. The first child, a boy, organizes his communication by subordinating some ideas to others. The second child, also a boy, reveals no plan of presentation; except for a loose chronology, his content lacks the coherence and emphasis necessary to communicate successfully to another person. He is not fully aware of dependent clauses as a way to order and communicate his ideas.

Subject Manuel:

> Well, I was climbing a fence--me and another boy./ He's Chico./ He lives somewhere by us./ A boy pulled on our pants so when we got down we would fall./ So when I went to get down, well, he let go,/ and I jumped down and fell on Chico./ So the boy came around from the fence/ and he started to spit at us/ and we started to run where my daddy was./ But my daddy wasn't there./ He was in the front office,/ and so I told another man that works there./ And the boy went and got a coke and drank it and left./

Subject Bradley:

> Superman, I seen him last night . . . Clark Kent in Superman, do you know?/ An he, an he puts a aspirin, you know, a bad man put the aspirin in this little . . . in here,/ an, an he said,

> and this guy, well he told him . . . an he says how . . . an, an an this guy pick-pocket him/ and he said, an the man said, "Is that the latest report?/ Let's see."/ An he said, "No."/ This man --see he's a bad man--and the guy he's working for--the boss-- well, then he came up and he said, "Give the man some coffee./ Have some for me too."/ And then he went ahead with his money./

Although the first subject misses an opportunity to smooth his expression by subordinating his reference to Chico and location of Chico's home, his discourse is nevertheless relatively coherent. In organizing his material he subordinates four different elements, including one instance of second-order subordination. The second subject, Bradley, on the other hand, displays little or no plan of presentation for his account of the television program. His language is cluttered with false starts, and only once does he resort to subordination as an aid to organizing his material ("the guy he's working for"). Because he doesn't decide what to feature and what to subordinate, Bradley's talk lacks plan and order. In terms of language elements that can be identified and quantified, one major difference between Bradley and Manuel lies in the use of dependent clauses.

One difference in kinds of dependent clauses among three groups of subjects--low, high, and random subgroups--appears in Figure 7. Adverb and noun clauses are much more common than adjective clauses in the early years of school. In all of these, the high group exceeds the low group in incidence of use. Except for adjective clauses in grades two and three, the number of clauses increases each year. The adverb clause appears to discriminate between groups much more than does the noun clause.

One note of caution needs to be presented. Although the incidence of dependent clauses in expression is usually a measure of grammatical and semantic complexity, it is not an absolute measure of these matters. To be sure, LaBrant found an increasing proportion of dependent clauses a mark of increasing language development from grades four to nine, an increase that was a function both of mental and chronological age.[1] Her method, known as the subordination index, depends upon a count of all the dependent clauses in a transcript. The number of dependent clauses is then divided by the total number of clauses, both dependent and independent. This proves to be a helpful measure of increasing grammatical complexity, but it disregards other linguistic structures which also enable speakers and writers to compress their thought and to communicate their ideas effectively. For instance, infinitives, participial phrases, gerunds, appositives, and other devices can contribute to compression and effectiveness. Furthermore, complex sentences sometimes reflect confusion rather than control; indeed some complex sentences could be improved by being recast as simple sentences. Consequently, the reader must bear in mind that indices of subordination, whether the straight count of LaBrant or the weighted count used in this study, are not perfect instruments of analysis.

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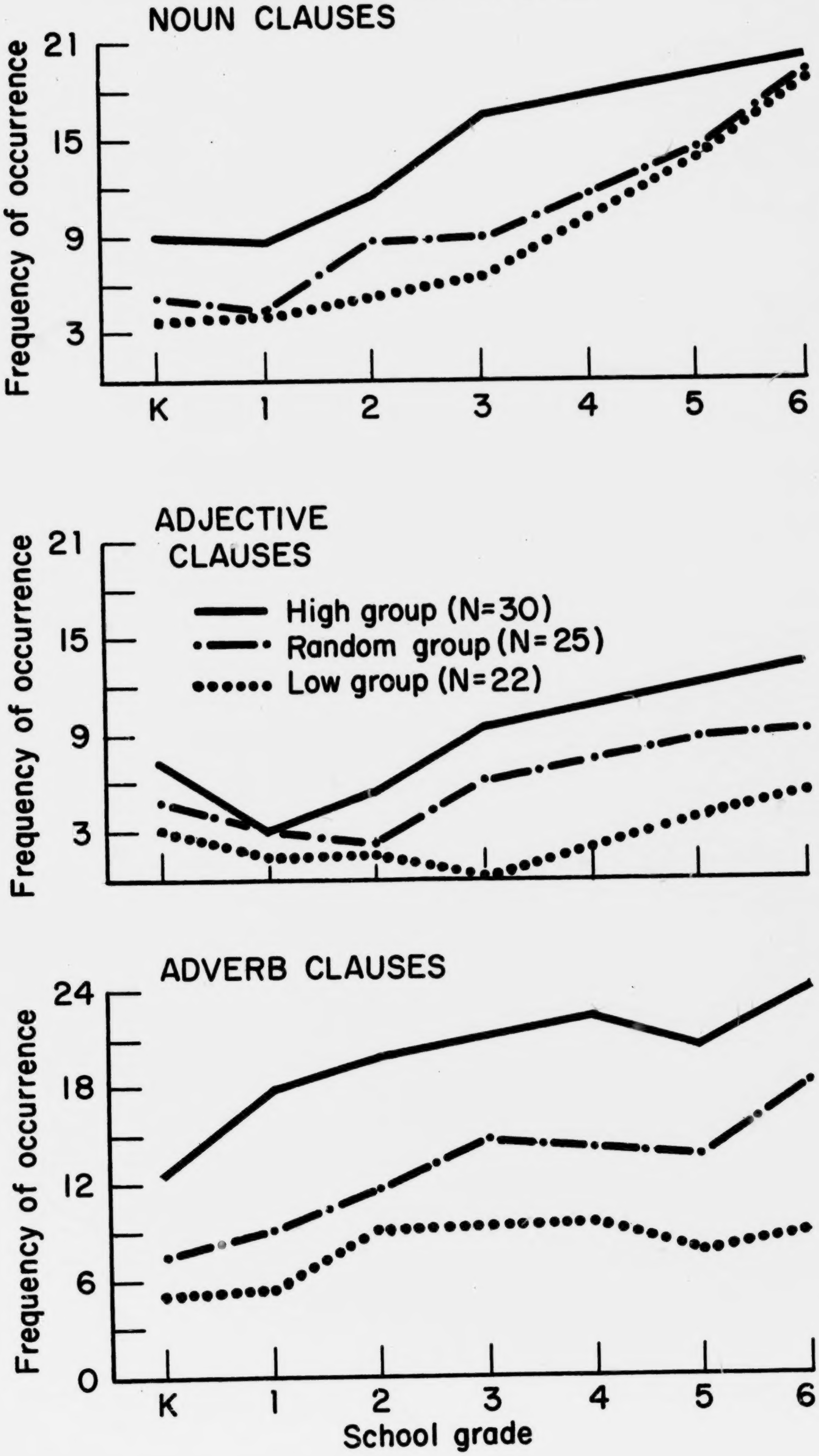
[1] LaBrant, _op_. _cit_.

FIGURE 7

INCIDENCE OF SUBORDINATION
FREQUENCY OF THREE TYPES OF SUBORDINATION

High, Low, and Random Group of Subjects
Grades Kindergarten through Six



NOUN CLAUSES

ADJECTIVE CLAUSES

ADVERB CLAUSES

The present study employs two measures of grammatical complexity: (1) a weighted index of subordination granting heavier weight to a dependent clause within another dependent clause or modifying another dependent clause; and (2) a more highly refined measure--the Chomsky technique of transformational grammar--which identifies every means of grammatical complexity. These two methods and their results are presented in the next few pages.

The Weighted Index of Subordination

For three subgroups--the high, low, and random--all dependent clauses were tallied as follows:

1 point for each dependent clause (first-order dependent clause)

2 points for any dependent clause modifying or within another dependent clause (second-order dependent clause)

2 points for any dependent clause containing a verbal construction such as an infinitive, gerund, or participle

3 or more points for any dependent clause (or clauses) within or modifying another dependent clause (or clauses) which, in turn, is within or modifies another dependent clause (third-order dependent clause).

As will be seen in Table 22, the high group uses such grammatical complexity to a much greater extent than the other two groups. The low group uses the least amount of grammatical complexity, although all groups show an increase in grammatical complexity as chronological age increases. In the data from which Table 22 is constructed, the boys in the low group made scores consistently beneath those of the girls in the low group. This was not true of the boys in the high group who were superior to the girls in kindergarten as well as in grades one, three, and five.

TABLE 22

SUBORDINATION INDEX: INCIDENCE OF SUBORDINATION WEIGHTED ACCORDING TO USE OF DEPENDENT CLAUSES AND VERBAL PHRASES IN ORAL LANGUAGE

High, Low, and Random Group of Subjects
Grades Kindergarten through Nine
High N = 25 Random N = 25 Low N = 25

	Median[1]			Adjusted Median[2]		
Grade	High	Random	Low	High	Random	Low
Kindergarten	19	11	6	26	19	12
One	21	15	8	27	21	13
Two	30	21	9	32	23	16
Three	34	23	11	28	25	21
Four	42	30	13	35	27	18
Five	44	32	21	36	29	24
Six	53	41	25	33	30	22
Seven	78	47	21	40	33	25
Eight	68	49	33	41	37	29
Nine	82	48	48	46	32	29

[1] The median is the mid-score based on the weighted index.

[2] The adjusted median is the mid-score of each group when each subject's weighted index is divided by the total number of words in the subject's transcript. This adjusted score was computed in order to avoid favoring subjects who use more language than others and was then multiplied by 1000. This latter multiplication was made merely to shift the decimal point in order to facilitate visual comparison.

An analysis of subordination in the subjects' written language is also of interest, and these data are shown in Table 23. Again, the adjusted median is the more meaningful figure although the high group shows a consistent superiority over the low group in both cases (the median and the adjusted median).[1]

One unusual feature of the data is that in grade nine the total group actually shows a higher median and a higher adjusted median than does the high group. This may simply be a quirk in the data or it may be a new tendency on the part of the high group to use shorter, more precise communication units in their writing. Fortunately the same subjects will be studied in grades ten, eleven, and twelve, and a more definitive answer may appear in subsequent data.

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[1] When comparing the adjusted median on written language (Table 23) to the adjusted median on oral language (Table 22), it should be noted that the written compositions are substantially shorter than the oral interviews. Therefore, the adjusted median on written language has been presented per 100 words whereas the adjusted median on oral language has been presented per 1000 words.

TABLE 23

SUBORDINATION INDEX:
INCIDENCE OF SUBORDINATION WEIGHTED ACCORDING TO USE
OF DEPENDENT CLAUSES AND VERBAL PHRASES IN WRITTEN LANGUAGE

High, Low, and Total Group of Subjects
Grades Four through Nine
High N = 25 Low N = 25
The N for the Total Group ranges from 234 in grade three to 217 in grade nine.

	Median[1]			Adjusted Median[2]		
Grade	High Group	Total Group	Low Group	High Group	Total Group	Low Group
Four	2	1	0	3.1	1.4	0.0
Five	1	1	0	2.1	2.0	0.0
Six	3	2	0	2.8	2.4	0.0
Seven	5	3	1	3.9	2.9	1.5
Eight	7	5	2	4.3	3.9	2.0
Nine	5	6	2	3.3	4.2	2.0

[1] The median is the mid-score based on the weighted index.

[2] The adjusted median is the mid-score of each group when each subject's weighted index is divided by the total number of words in the subject's written composition. This adjusted score was computed in order to avoid favoring subjects who use more language than others and was then multiplied by 100. This latter multiplication was made merely to shift the decimal point in order to facilitate visual comparison.

The Chomsky Technique of Transformational Grammar

For a more thorough study of grammatical complexity, this research has applied the methods of transformational grammar to the transcripts of two subjects. Transformational grammar identifies all forms of grammatical complexity, but it is a slow and long process of analysis. Its criteria are primarily structural. The combination of both structural and semantic criteria, used elsewhere in this study, is therefore set aside at this point and the present analysis limited to two structural questions: (1) How does the subject's grammar generate grammatical and ungrammatical utterances? and (2) By inference, what kind of grammatical model is the subject using in order to manipulate his structures?[1]

For our purposes here we will describe our grammar as a system of devices which reinforce each other in generating and controlling grammatical utterances. A "knowledge of one's grammar" will not, it must be pointed out, guarantee the consistent creation of grammatical sentences. Everyone who speaks English works from some kind of grammar; yet consciousness of the model is rare indeed, for as has been noted already in this research, the child knows the structure of his language by the time he is in kindergarten. Nor does it follow that all models are of equal power of accuracy.

Our grammar may be seen as existing and operating on two contiguous levels: (1) a phrase structure grammar and (2) a transformational grammar. The phrase structure grammar makes possible the simple, active kernel statements of our language--statements such as John eats, John eats onions, and *Onions are roots*. Within any kernel statement there are certain obligations and options. For example, a grammatical obligation in English is *concord* (or agreement) between subject and verb in active voice. An option, on the other hand, is the use of a general or specific determiner or no determiner at all. Thus,

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[1] The following description of transformational analysis and application to the language of two subjects in this research has been prepared by John Dennis, Assistant Professor of Language Arts, San Francisco State College, San Francisco, California.

$$\left.\begin{matrix}\text{A}\\ \text{The}\end{matrix}\right\}\ \text{boy eats}\ \left\{\begin{matrix}\text{the}\\ \text{a}\end{matrix}\right\}\ \text{onion.}$$

If the nominal phrase (or "complete subject") is singular or plural the verbal phrase (or "complete predicate") is obliged to agree in person and number. On the other hand, the use of *a* or *the* is optional here. Inclusion or exclusion of modification constitutes another option in phrase structure grammar. It is possible, however, that the selection of certain types of modification may impose structural obligations.

We may think of the generation of an utterance in phrase structure grammar as a series of steps, governed by a small body of rules which tell us what order the steps should take and what options and obligations we have as we proceed. Such a model would look this way:

Step 1. $NP_{singular} + VP_{singular}$
Step 2. The N V NP
Step 3. The boy Aux. V a N
Step 4. The boy (C) like a girl
Step 5. The boy (present) like a girl
Step 6. The boy likes a girl
Step 7. Pattern of communication unit: / 1 2 4/

Key

N = noun
V = verb
P = phrase
C = concord, tense

If we look now beyond the level of kernel structures, those simple active statements in our language such as the / 1 2 4 / communication unit just above, we observe the manipulation of those kernel structures according to options and obligations of a different sort. We note a number of specific and general transformations. At this higher level, the much more complex structures of our language can be produced by a succession of transformations. Examples of such grammatical operations beyond phrase structure grammar include passive constructions, auxiliary transforms, questions, negative constructions, emphatic constructions (using *do* and *did* plus primary stress), and the use of generalized conjunction transformations (the use of *and* to link sentence elements of the same type). Again there is an order which must be observed. If an active, positive statement is to be transformed into a passive, negative one, the passive transform must precede the negative one. Our earlier structure "The boy eats an onion" would be transformed through these steps:

Phrase structure: The boy eats an onion.

Transformation: (passive) An onion (past) be + en eat by the boy

Transformation: (auxiliary) An onion not be (past) eat + en by the boy

Transformation: (negative) An onion not be (past) eat + en by the boy

An onion was not eaten by the boy.

It could be argued that there is nothing "new" about this kind of operation. Grammarians have been writing about passive constructions and the use of negatives for a long time. The coining and the use of the term transformation itself does not bring enlightenment. However, the advantage of transformation theory and classification is clear. Through a model, what was previously explained in impressionistic or imprecise terms can now be made more orderly, explicit, and economical.

In this research we have chosen samples from the speech of two children. The subjects were a boy (Dino) from the high group and a girl (Anngelina) from the low group. The three sets of utterances used for analysis here were collected from each of them during a six-year period, at ages six, ten, and twelve. The stimulus used to elicit responses was a colored painting depicting a Mardi Gras scene, the third picture in the interview. In the painting people dressed for carnival are pulling an enormous clown. The same picture was used throughout the six-year period. The children have been given _a priori_ subjective classifications: the boy is considered an "effective" user of structure (high group); the girl, "ineffective" (low group).

In order to quantify and qualify these judgments in _objective_ terms, we followed this plan:

. . . All of the utterances of both children were _reduced_ from the transformational level to the phrase structure (kernel) level. In many instances, of course, the structures were already at the phrase structure level.

. . . The type and number of transformations used were noted. If a transform was faultily used, the type and frequency of misuse were noted.

. . . The types and frequencies of transformations were tallied as evidence to support these two hypotheses:

(1) the ability to make grammatical sentences at the transformational level indicates a greater control over structure than does the consistent creation of grammatical sentences at the phrase structure level;

(2) quantity and variety of transforms will probably reinforce one another. That is, the power of the grammatical model from which the subject is working will allow not only _more_ transformations, but transformations of different kinds. Grammatical control thus multiplies instead of simply adding.

Findings

1953; Both subjects are age six.

The boy, Dino, prejudged effective, produced in his first transcription fifteen kernel sentences. Nine of the fifteen kernels were produced from six transformations, one of which was faulty and therefore ungrammatical. The six transformations Dino produced were:

... Question (1)

... Wh transform (use of the relative pronoun or "zero" relative) (1)

... Elliptical transform (use of an -ing form as a noun modifier: "There is a clown/ (He is) holding a little clown.") (3)

... Faulty conjunction transform: ("There is a clown in a white suit and black buttons and blowing a horn.") (1)

The girl, Anngelina, prejudged less effective with language, produced only six responses. Three of these were syntactically incomplete and could be called "naming" responses, but not utterances of a "minimum free" type. She produced three transforms:

... Wh transform (1)

... Negative transform (2)

1957; Both subjects are age ten.

Dino produced thirty-two kernel sentences. Of these, sixteen were produced from nine transformations of the following types:

... Elliptical (1)

... Conjunction (including causal and conditional types) (3)

... Indirect object (1)

... Negative (1)

... **Comparative** (as big as) (1)

... Faulty conjunction (2)

Note: Dino combined three sentences in one complex transform; he tried to combine four kernels to make another, but two of these resulted in a faulty transform.

Anngelina produced nine kernel sentences. Of these, four were produced from two transforms:

... Conjunction (1)

... Faulty conjunction (1)

1959; Both subjects are age twelve.

Dino produced sixteen kernel statements. All but one of them are reduced from transformations. Dino's utterances are few in number but complex in quality. Dino uses:

... T wh (4)

... T passive (1)

... T ellipsis (2)

... T conjunction (4 sentences linked) (1)

... T conjunction faulty (1)

Two, three, and four kernel sentences are combined in this sample of Dino's language.

Anngelina had seventeen kernels but only three transforms:

... T conjunction (1)

... T wh (1)

... T indirect object (1)

Anngelina produced four ungrammatical sentences because of lack of concord between $NP_{pl.}$ and $VP_{pl.}$. She used VP sing. (Aux.): (i.e., "They was . . .").

Summary

Two Subjects' Transformational Skills from Age Six to Age Twelve

Dino

Grammatical transformations	20
Faulty transformations[1]	4
Total transformations:	24

Frequency and types of grammatical transformations:	
Who or what	5
Other questions	1
Negatives	1
Ellipses	6
Conjunctions	4
Indirect objects	1
Comparatives	1
Passive	1
Total	20

Anngelina

Grammatical transformations	7
Faulty transformations[1]	1
Total transformations:	8

Frequency and types of grammatical transformations:	
Who or what	2
Negatives	2
Indirect objects	1
Conjunctions	2
Total	7

[1] The faulty transformations were conjunction transformations.

This transformational analysis, although carried out for only two subjects, illustrates the possibilities of a more precise method of measuring grammatical complexity. Dino's ability to make grammatical sentences at the transformational level shows his greater control over structure than does Anngelina's persistence in creating all but seven of her sentences at the phrase structural level. Furthermore, Dino is not only producing more transformations than Anngelina but also more different kinds of transformations than Anngelina.

At the age of ten, Dino is handling grammatical transformation with a proficiency Anngelina has not yet reached even at the age of twelve. Examination of the transcripts for the low and high groups shows clearly that this difference prevails for all subjects in the two groups. The method, therefore, holds promise for future research.

Both the weighted index of subordination and the transformation analysis support the hypothesis that complexity of grammatical structure is associated not only with chronological age but also with proficiency in language. The high group uses more subordination than the low group and in particular uses more adverbial dependent clauses, second-order subordination, and subordination which includes infinitive and verbal phrases. Boys in the low group make consistently poorer scores in subordination than do girls in the low group.

Because the socio-economic rank of the high group exceeds that of the low group, it appears that coherence through subordination is also related to socio-economic status. The importance of socio-economic status in relation to language appears not only on this matter of subordination but also on the measures of writing, mazes, subordinating connectives, reading, and conventional language. Bernstein, on the basis of research with British working-class youth, found language proficiency grossly depressed in relation to scores on a nonverbal intelligence test.[1] He believes that the level of linguistic skill may be independent of potential intelligence and that different environments affect language structure. The linguistic differences he finds between working-class youth do not, in his view, reflect differences in potential capacity. Rather they represent entirely different forms of the English language, forms which systematically orient children to differing relationships with people and the world about them. The middle class, for instance, uses forms of speech "in which the arrangement of syntax varies greatly from one individual to another and in which the formal possibilities of sentence organization are used to clarify meaning and make it more explicit." The lower working classes show "a rigidity of syntax, a limited and restricted use of the structural possibilities for sentence organization, a form of relatively condensed speech in which certain meanings are restricted and the possibility of their elaboration . . . reduced. . . ." Nothing in the present research with subjects on the west coast of the United States controverts Bernstein's findings or conclusions. It also seems entirely possible that subjects from the least favored socio-economic categories can find themselves at a disadvantage in schools where the verbal linguistic skills of the middle class prevail. Such subjects may find themselves increasingly ill at ease and self-conscious to the point of avoiding oral performance. Such avoidance could, in turn, progressively affect performance in the related activities of reading and writing and in the present study could quite logically account for the larger number of mazes among the children in the low group.

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[1] Basil Bernstein, "Language and Social Class," British Journal of Sociology, XI (1960), pp. 271-276.

________, "Some Sociological Determinants of Perception," British Journal of Sociology, IX (1958), pp. 159-174.

________, "Social Class and Linguistic Development: A Theory of Social Learning," Education, Economy, and Society, ed. A. H. Halsey, Jean Floud, and C. Arnold Anderson (New York: Macmillan [Free Press of Glencoe]; 1961).

6. Coherence through the Use of Subordinating Connectives

The accurate use of subordinating connectives such as *although*, *because*, and *unless* has been shown to develop with age. Watts[1] devised a multiple-choice test with items such as the following:

> He loves his mother, although
>
> a) she loves him.
> b) she is unkind to him.
> c) she is kind.
> d) he does not.

Beginning in grade five, this Watts Test of Subordinating Connectives was administered, and the results are shown in Figure 8 for the high, low, and total groups. When examining this figure, it should be kept in mind that fifty is the maximum possible score. As a result the high group's room for improvement is quite small and this gives the visual impression that the low group is "catching up."

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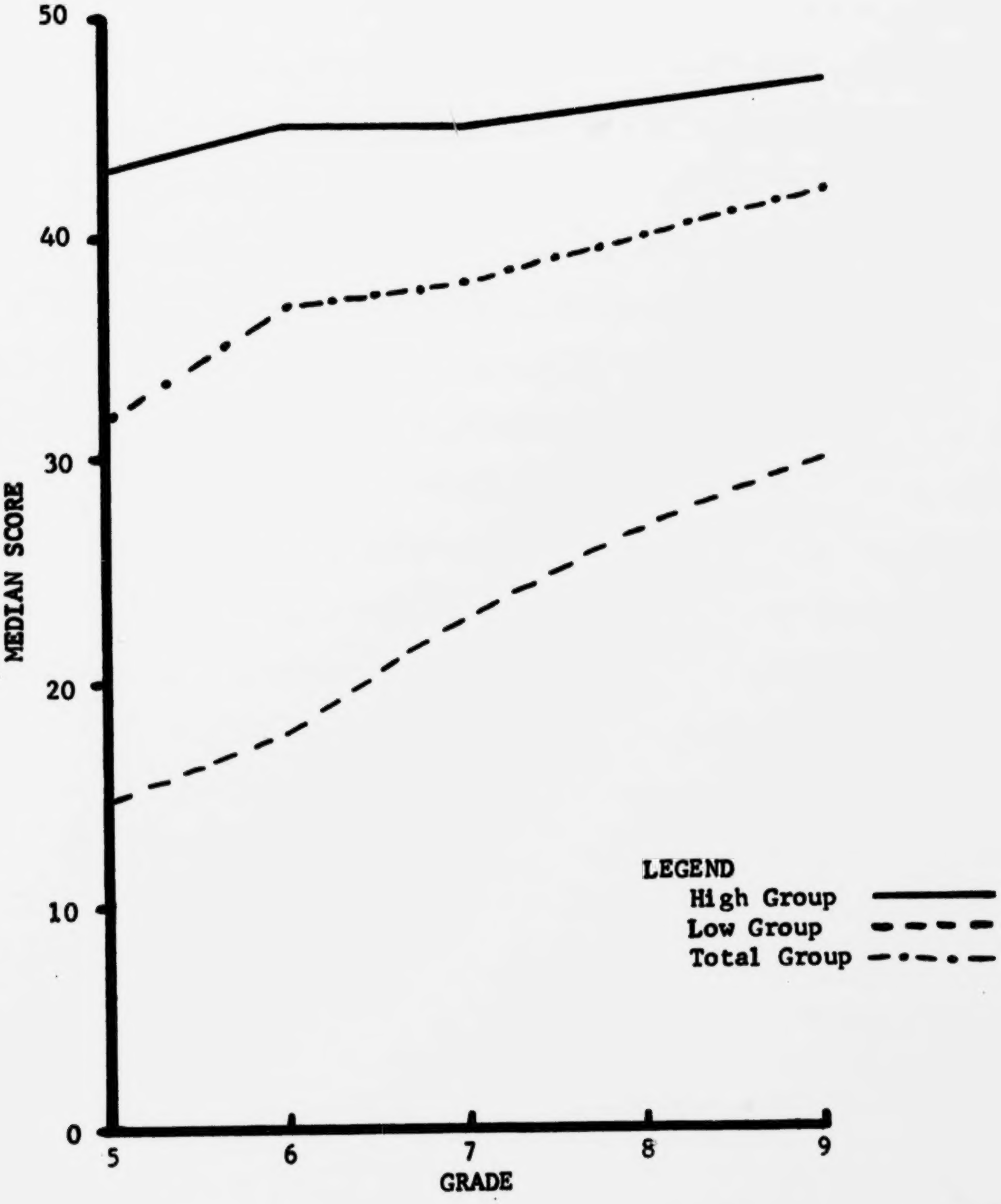
[1] Watts, *op. cit.*, pp. 82-84 and 302-305.

FIGURE 8

MEDIAN SCORES ON ABILITY TO USE SUBORDINATING CONNECTIVES

High, Low, and Total Group of Subjects
Grades Five through Nine



High Group N = 25
Low Group N = 25

Total Group N = 246 (5th)
237 (6th)
230 (7th)
224 (8th)
220 (9th)

The socio-economic status of the total group of subjects is again of interest. If the median, the inter-quartile range, and the total range for the Watts Test are examined, we obtain the clear trends shown in Table 24. On the total range there is some overlap among the socio-economic groups and this is, of course, typical.[1] Notable, however, is the steady decrease in the median as one reads down the socio-economic scale. And even more notable is the clear trend shown by the inter-quartile range. With only one exception during all of the years presented, the lower limit of the inter-quartile range for socio-economic group I exceeds the upper limit of the inter-quartile range for socio-economic groups V, VI, and VII. In other words, when looking at the central fifty per cent of the subjects in these socio-economic categories, we find that the lowest subject in socio-economic I actually scores higher than the highest subject in socio-economic V, VI, or VII. In conclusion, the data show an increasing use of subordinating connectors with chronological age (upward movement of all medians), with language ability (the high group versus the low group), and with socio-economic status (the clear evidence shown in Table 24).

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[1] On all measures in this research there is always some overlap when examining a given piece of data as it relates to socio-economic status. In other words there are always some dull students among the economically advantaged and some bright students among the economically disadvantaged. The question is always one of degree rather than one of absolutes.

TABLE 24

SOCIO-ECONOMIC COMPARISON OF TOTAL GROUPS OF SUBJECTS ON ABILITY TO USE SUBORDINATING CONNECTIVES

Grades Five through Nine

Socio-Economic Status	Number of Subjects	Median					Inter-quartile Range					Total Range				
				Grade					Grade					Grade		
		Five	Six	Seven	Eight	Nine	Five	Six	Seven	Eight	Nine	Five	Six	Seven	Eight	Nine
I	27	42	43	45	45	46	37-43	41-45	42-46	42-47	43-47	30-47	34-49	34-47	40-49	38-49
II	42	37	41	42	43	44	34-42	36-44	35-44	39-45	39-46	0-47	0-48	0-48	0-49	0-49
III	39	38	40	42	43	44	32-42	36-45	37-44	40-46	41-46	11-48	11-49	26-48	31-49	30-49
IV	24	33	39	40	41	44	21-39	32-42	33-43	37-44	39-45	13-45	14-45	29-46	26-47	34-48
V	50	28	32	36	37	40	15-33	19-39	26-39	31-41	32-44	0-46	0-47	0-48	0-47	6-48
VI	45	22	25	32	35	38	14-31	17-36	23-39	27-39	33-41	0-41	0-42	0-46	0-46	0-46
VII	19	22	29	34	36	37	17-32	21-36	29-38	31-38	33-40	0-39	0-43	13-45	20-42	20-47

7. Coherence through Control of Mazes

Too much difficulty with mazes--especially with long unresolved mazes--testifies not only to lack of fluency but also to poor control over speech and ineffectiveness in communicating with others. In Tables 2b and 2c the reader has already noted that from kindergarten through grade three both the low and high group continues to have difficulties with mazes, the low group increasing the number of words per maze and the high group decreasing them slightly. From grades four through nine, as has been previously noted, the volume of language needs to be taken into account. The high group consistently maintains a lower proportion of mazes and words in mazes than does the low group. On this matter, however, it is particularly important to note the measure of variability for all ten years. On words per maze the standard deviation is decreasing for the high group, but for the low group, this standard deviation is inconsistent and erratic until grade four.

Direct inspection of the mazes shows what is happening. Members of the high group are controlling each maze, holding it down to a few words. For example, this maze from a boy in the high group:

> "That looks like a funny clown [holdin' a . .] holdin' a puppet in both hands."

On the other hand, members of the low group are increasing the number of words in many of their mazes:

> "[Then . then-n . you, then a boy hear you say . then-d] then they chase you."
>
> "[These two are . . an this one who . who has .] these are all pirates having a party."

However, the low group's inconsistent behavior in variability of words per maze may be a promising rather than a discouraging development, for it may well be a sign of growth through striving. They may also be striving in a situation where language is used in a manner they do not encounter in their homes. And in fact, data for grades four through nine tend to bear out this hypothesis. (See Table 2c.) Although the low group consistently performs more poorly than the high group in respect to mazes, words in mazes, and average words per maze, the subjects have succeeded in gaining better control over this obstacle to fluency. This is evidenced by the decline for the low group (grades four and five) in both incidence and variability of average words per maze. In grade six, a difference does occur, but it is not large.

For the present purpose the evidence on mazes does show that subjects are not in perfect control of their speech, whether they are rated low or high in language ability. It also shows that those highest in language ability speak somewhat more effectively and control more skillfully these difficulties of expression.

8. Coherence of Spoken Style

Among the features of spoken style which were classified, one category was coherent-to-incoherent. The high group cannot be proved more coherent than the random group, but the low group was less coherent than the random group. This latter difference was significant at the one per cent level.

The evidence on spoken style also indicates that the subjects low in language ability follow more unconventional usage and speak less distinctly than the random group. They also tend to be slower in responding to conversation. Those high in language ability are more fluent, deliberate, conventional in their usage, and possibly more distinct in their speech than the total group.

SUMMARY OF EFFECTIVENESS AND CONTROL

Effectiveness and control of language have been examined by eight types of assessment. Although the subjects vary little in their use of the basic structural patterns of English, those high in language ability show much greater dexterity in varying _the elements within these patterns_. Their repertoires for filling in the nominal positions and the movables of English syntax are clearly more varied than those of the group low in language ability. The high group also shows a greater sensitivity to the conventions of standard English, uses provisional and conditional statements more often, shows greater competence in writing and reading, and excels in coherence as measured by four different forms of assessment. The high group proves to be drawn from a higher socio-economic status than the low group.

CHAPTER THREE

MASTERY OF CONVENTIONAL USAGE AND GRAMMAR

This section of the present study deals with what earlier studies frequently called errors in grammar. Strict, valid definitions of grammar and error, however, require a different terminology. By grammar we will mean the set of formal patterns in which the words of a language are arranged in order to convey larger meanings. Grammar is the description and analysis of these formal patterns in the English language.

By usage we will mean the established language habits of an individual in speech and writing, the habits he accepts and rejects. We will assume that such usage is interiorized by imitating the speech of his home and neighborhood, not a deliberate plan rationalized on a conscious level.

Acceptable standard English, according to the widely-used definition by Fries, is "a set of language habits in which the major matters of the political, social, economic, educational, religious life of this country are carried on. To these language habits is attached a certain prestige, for the use of them suggests constant relations with those responsible for the important affairs of our communities. It is this set of language habits . . . which is the "standard" not because it is any more correct or more beautiful or more capable than other varieties of English; it is "standard" solely because it is the particular type of English used in the conduct of the important affairs of our people. It is also the type of English used by the socially acceptable of most of our communities, and insofar as that is true it has become social or class dialect in the United States."[1]

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[1] Charles Carpenter Fries, American English Grammar. New York: Appleton-Century-Crofts, 1940; p. 13.

Consequently, we will be concerned in this study with departures or deviations from standard English usage. It should be further noted that we are not concerned with disputed items such as It's me, Who are you looking for?, or Everyone has their instructions. Instead we mean, by nonstandard, usages such as these:

> The calf don't want no milk.
>
> He has ate.
>
> Him washing he clothes.
>
> They was here yesterday.

The exact deviations from standard usage and their occurrences will be presented after a discussion of the sample and the methods of analysis. All evidence dealing with deviations from accepted usage is based upon taped transcripts of oral language.[1]

THE SAMPLE

The sample is composed of three subgroups, each of which contains twenty-one subjects. According to their proficiency with language, the three subgroups were selected from the total group of subjects in the overall study and have been designated respectively as High Caucasian group, Low Caucasian group, and Low Negro group.[2]

METHOD OF SELECTION

A ten-year average of oral language ratings (teachers' ratings) was computed for all subjects in the overall study on whom data were available for ten successive years. The three subgroups, each with twenty-one subjects, were then selected on a rank-order basis.

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[1] Written samples from each of the subjects are available but have not yet been analyzed in terms of deviations from accepted usage.

[2] The reader should not confuse these new subgroups with the regular high and low groups which are used throughout this research. There is, of course, a broad overlap in that all Caucasian subjects in the regular high group fall into the High Caucasian group and all Negro and Caucasian subjects who fall into the regular low group also fall respectively into the Low Negro group and the Low Caucasian group.

Pertaining to the composition of the subgroups and the method of selection, the following should be noted:

(1) A preliminary examination of the data made it obvious that some language deviations were predominantly ethnic in origin. Therefore, rather than risk clouding the data by using ethnically mixed groups, the decision was made to study Caucasians and Negroes separately. If ethnically mixed groups of twenty-one subjects had been used on a straight rank-order basis, two Negroes would have fallen into the high group; the low group would have been predominantly Negro.

(2) For the same reason as that cited above--ethnic origin of some language deviations--Oriental subjects were excluded when the subgroups were selected. No separate study of the language deviations of the Oriental subjects was undertaken because of the limited number of members of this ethnic group in the overall study.

(3) The criterion of including only those subjects on whom complete data were available for ten full years was utilized to avoid substituting one subject for another as a result of the normal attrition rate in the overall study. (The number of subjects in kindergarten was 338; in grade nine, 220.) It was felt that repeated substitution might allow individual idiosyncracies of particular subjects to affect the data grossly. As a result, some of the highest-ranking subjects in the overall study as well as some of the lowest-ranking were not used because they had dropped out before grade nine. Therefore, there is a strong presumption that in a true sample of the population the spread between the designated subgroups would be even greater than our data indicate.

STATISTICAL PROBLEMS AND METHOD OF ANALYSIS

One method of dealing with language deviations would be to take each transcript for each subject and compare the number of times a particular deviation actually occurs to the number of times the same deviation could occur (the Error Quotient). However, the present study deals with nineteen different language deviations as they occur for sixty-three individual subjects, each of whom has ten transcripts for the years 1953-1962. In gross terms, the Error Quotient would require nineteen separate word-by-word tallies on over five hundred and fifty thousand words.[1] This in turn would require a prohibitive amount of time and money. Furthermore, the Error Quotient masks the data by reporting the same quotient for such an example as the following:

one error in agreement of subject and verb out of two possibilities

five errors in pronoun case out of ten possibilities

In efforts to find a more useful method of dealing with deviations as they occur in individual subjects, two serious problems were encountered:

(1) The individual range in volume of spoken language is quite wide. This creates a statistical comparability problem because of the nature of language itself: short simple sentences or one-word answers tend to reduce the probability of making language deviations. In fact, the only subject who has "perfection" in usage is in the Low Caucasian group--no deviations in his kindergarten total of sixty-eight words.

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[1] Some idea of the magnitude of the overall study can be visualized by considering N averaging 240 for the thirteen-year period and the yearly transcripts averaging over 1000 words. A total of over three million words of spoken language will be gathered and analyzed as well as data on reading, writing, listening, etc.

(2) In any given year a subject's deviations are usually centered in certain categories, with no deviations in other categories. In successive years his own pattern often changes--no deviations in the categories wherein he had previously made them; deviations in categories wherein there had been none in previous years.

However, as the statistical work progressed, it became obvious that each particular subgroup is a clearly homogeneous unit. The means and medians on various measures indicate that the High Caucasian group is consistently superior to the other two groups on all measures and by approximately the same degree. In addition, the Low Caucasian group and the Low Negro group reveal not only this consistent relationship to the High Caucasian group, but also a consistent relationship to each other: the Low Caucasian group invariably shows some superiority to the Low Negro group. Among the examples of these consistent relationships are the following:

(1) The High Caucasian group shows a considerably higher mean and median for total words in communication units than either the Low Caucasian group or Low Negro group. In turn, the Low Caucasian group shows a slight superiority to the Low Negro group on both means and medians except for the medians in grades two and three where both groups are virtually identical. (See Table 25.)

(2) On average words per communication unit the picture is identical--a large measure of superiority by the High Caucasian group, a relatively

slight lead by the Low Caucasion group over the Low Negro group. (See Table 26.)[1]

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[1] As the reader will recall, the researcher feels that average words per communication unit is a measure of great significance. A high average words per unit could conceivably be only a measure of verbosity: more words but no increase in meaningful verbal communication. However, throughout this research, a high average words per unit has been inevitably coupled with increased complexity of sentence structure. Thus the supremacy of the High Caucasian group on this measure is of even greater significance than it may at first appear, for, as will be shown presently, this group has far fewer deviations than either of the other two groups *in spite of the fact that members of the High Caucasian group use greater complexity of sentence structure*.

TABLE 25

TOTAL NUMBER OF WORDS IN COMMUNICATION UNITS

High Caucasian, Low Caucasian, and Low Negro Groups[1]
Grades Kindergarten through Nine

Grade	Mean			Median		
	High (Caucasian)	Low (Caucasian)	Low (Negro)	High (Caucasian)	Low (Caucasian)	Low (Negro)
Kindergarten	597.71	472.76	461.05	569	451	400
One	639.52	452.86	428.52	558	435	308
Two	849.43	634.52	620.24	770	538	539
Three	973.38	602.90	528.48	964	549	548
Four	1303.71	845.05	643.90	1215	801	594
Five	1396.33	1138.52	921.29	1255	1059	862
Six	1824.00	1086.86	998.19	1722	976	947
Seven	1701.43	1333.05	1123.62	1650	1339	974
Eight	1539.57	1313.00	1238.29	1507	1159	1142
Nine	1751.29	1348.52	1243.90	1684	1198	1054

[1] N = 21 for each group.

TABLE 26

AVERAGE NUMBER OF WORDS PER COMMUNICATION UNIT

High Caucasian, Low Caucasian, and Low Negro Groups[1]
Grades Kindergarten through Nine

	Mean			Median		
rade	High (Caucasian)	Low (Caucasian)	Low (Negro)	High (Caucasian)	Low (Caucasian)	Low (Negro)
inder-garten	5.86	4.93	4.28	6.34	5.33	4.22
One	7.01	5.53	4.88	7.00	5.96	4.94
Two	7.04	6.02	5.54	7.08	6.32	5.66
Three	8.05	6.70	5.80	7.61	6.91	6.26
Four	8.79	7.45	6.44	8.97	7.68	6.68
Five	8.84	7.29	6.89	9.01	7.43	7.09
Six	9.70	7.62	7.58	9.80	7.69	7.51
Seven	10.55	8.80	8.01	10.78	8.91	8.19
Eight	11.02	9.24	8.30	10.61	9.24	8.33
Nine	10.89	8.88	8.56	10.66	8.88	8.45

[1] N = 21 for each group.

(3) Measures of I.Q., standard reading scores, writing, and the use of subordinating connectives again show the consistent relationship among the groups. (See Table 27.) As can be seen in this table, one or two subjects in each group are at the extremes on each of these measures of performance (the total range) and this accounts for a slight overlapping. However, the medians clearly differentiate among the groups and it is felt that teachers' ratings (the method by which the groups were selected) are an excellent method of selection.[1]

(4) Lastly, the socio-economic status of the subjects is precisely what one would expect after looking at the socio-economic data in the overall study: those ranked high are of predominantly high socio-economic status; those ranked low are of predominantly low socio-economic status. (See Table 28.) Again, there is a consistent relationship among the three groups.

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[1] One of the many items being studied in the present research is a method to devise a weighted index to further improve the selection of subjects high and low in language ability. The process of assigning weights to the various components of such an index is, of course, the crucial process. A scale to achieve this selection process is being developed.

TABLE 27

MEDIAN SCORES AND RANGE ON SELECTED MEASURES AT GRADE SIX

High Caucasian, Low Caucasian, and Low Negro Groups[1]

Type of Measure	High (Caucasian)		Low (Caucasian)		Low (Negro)	
	Median	Range	Median	Range	Median	Range[2]
Teacher's Rating	4.14	3.97 to 4.56	2.65	2.11 to 2.89	2.32	1.75 to 2.60
I.Q.	120	109 to 143	96	55 to 113	86	60 to 112
Reading (above or below chronological age)	+4 yrs. and 2 mos.	+1 yr. and 1 month to +5 yrs. and 2 months	-0 yrs. and 8 mos.	-5 yrs. and 0 months to +1 yr. and 4 months	-2 yrs. and 0 mos.	-4 yrs. and 8 months to +1 yr. and 7 months
Writing	II	I to II	III	II to V	III	II to V
Use of Subordinating Connectives	46	39 to 49	31	0 to 39	19	0 to 38

[1] N = 21 for each group.

[2] One subject in the Low Negro group has consistently higher scores than the other twenty subjects in that group. If this subject had been excluded, the upper limit of the range would have fallen considerably closer to the median.

TABLE 28

SOCIO-ECONOMIC STATUS AT GRADE NINE

High Caucasian, Low Caucasian, and Low Negro Groups

Socio-Economic Status	Number of Subjects Classified as HIGH (CAUCASIAN)	Number of Subjects Classified as LOW (CAUCASIAN)	Number of Subjects Classified as LOW (NEGRO)
I	10	1	0
II	5	6	0
III	5	2	0
IV	0	3	1
V	0	6	3
VI	1	3	13
VII	0	0	4
TOTAL	21	21	21

In addition to all of the above evidence indicating that the three groups are homogeneous units, it was also found that the arithmetic means on the nineteen separate language deviations and on the number of deviations per equated number of words spoken revealed a consistent relationship with the High Caucasian group typically being far superior, the Low Caucasian group next, and the Low Negro group last. The medians also showed consistent relationships, but the researcher ruled out the use of medians because of the fact that both the High Caucasian and Low Caucasian group often had a median of zero on any given deviation for any given year. This was not true of the Low Negro group, and as a result any proportional adjustment of the data would have produced fluctuations in the Low Negro group which were not actually in the data.[1]

With the use of medians ruled out, the question was then the following: Would the use of the arithmetic mean possibly allow one or two extreme numbers to skew the data and make it non-representative? In other words, on any given deviation from accepted usage would one or two subjects "have a bad day"? Or would they possibly get tangled and make the same deviation an inordinate number of times? To guard against this possibility, it was decided to subtract the deviations of the two extreme subjects before proportionally adjusting the data.[2] In short, the method of analysis decided upon has been to equate the data so that it is comparable from year-to-year and subgroup-to-subgroup and then to present the arithmetic mean of each particular subgroup.[1] The method used therefore gives a profile for a typical subject in a particular category (High Caucasian, Low Caucasian, Low Negro) but does not offer a method to precisely study deviations of an individual subject.

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[1] Trying to deal with zero quantities is one of those frustrating items which all researchers inevitably encounter. The problem basically is that 2 × 0 or 10 × 0 or 1/2 × 0 all come out to be zero.

[2] The subject who had the greatest total number of deviations was not eliminated. The process was to eliminate the two highest numbers on each individual deviation on a year-by-year, deviation-by-deviation basis for each group. To lend even further comparability, the two highest totals for number of words in communication units were also subtracted.

Because the data on deviations are so extensive, the researcher feels that the clearest presentation may be shown by first presenting an explanation of all deviations followed directly by three tables, one for each group, indicating the adjusted mean for each deviation. (See Tables 29, 30, and 31.) The procedure will be to show each deviation graphically and to present examples and explanations of each particular deviation along with the graphic presentation.

---

[1] Before actually deciding upon the method of presentation to be used, the data were analyzed and graphed, using six different approaches: (1) developing mean factors in order to equate all groups to the High Caucasian group; (2) dividing the equated data by average words per unit; (3) developing mean factors to equate each group to 1000 words of spoken volume; (4) dividing the equated data of 1000 words of spoken volume by average words per unit; (5) developing mean factors to equate each group to 1000 words of spoken volume, after first subtracting two extreme values for words in units and individual deviations for each group on a year-by-year basis; (6) dividing the resulting equated data by average words in units. Each method of analysis not only showed consistent general trends but such a remarkable degree of similarity that it was actually difficult to visually differentiate between the graphic presentation of a particular deviation when one method of approach was compared to another. For this reason it was felt that the fifth method indicated would be the best method to present: It is clear and straightforward without undo statistical manipulation and also has the characteristic of smoothing off some of the peaks caused by one or two extreme cases.

1A: Agreement of subject and verb in the third person singular (excluding all forms of the verb *to be*).

1B: Agreement of subject and verb for all forms except the third person singular (again excluding all forms of the verb *to be*).

1B: Agreement of subject and verb using only forms of the verb *to be*.

1C: All verb problems concerned with consistency in the use of tense.

1D: Omission of auxiliary verbs.

1E: Nonstandard verb forms.

2A: Nonstandard or confusing use of pronouns.

2B: Use of *that* instead of *who* as a relative pronoun referring to persons.

3A: Ambiguous placement of a word, phrase, or clause.

3B: Awkward arrangement, incoherence, or critical omission (for example, of both subject and predicate).

4A: Careless omission (except auxiliary verbs).

4B: Unnecessary repetition.

5A: Nonstandard use of prepositions.

5B: Nonstandard use of conjunctions.

6A: Nonstandard use of adjectives.

6B: Nonstandard use of adverbs.

7: Nonstandard noun forms.

8. Double negatives and possessives.

TABLE 29

ADJUSTED MEAN ON DEVIATIONS BY HIGH CAUCASIAN GROUP PER 1000 WORDS OF SPOKEN VOLUME

Grades Kindergarten through Nine
N = 21

Type of Deviation	Grade									
	Kindergarten	One	Two	Three	Four	Five	Six	Seven	Eight	Nine
1A	0.09	0.18	0.14	0.24	0.04	0.00	0.00	0.00	0.04	0.00
1B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(1B)	2.28	1.86	2.40	1.83	0.85	0.45	0.49	0.46	0.60	0.40
1C	0.70	0.97	0.97	1.00	2.55	2.52	1.89	1.74	1.20	1.60
1D	1.00	0.97	0.61	0.59	0.36	0.29	0.49	0.29	0.38	0.30
1E	1.28	0.97	0.42	0.36	0.63	0.45	0.24	0.55	0.30	0.23
2A	1.79	1.32	1.58	1.24	1.34	1.42	1.31	2.95	1.77	1.26
2B	0.09	0.79	0.34	0.76	0.54	1.06	0.73	0.88	0.90	0.83
3A	0.09	0.35	0.61	0.53	0.45	0.32	0.82	1.02	1.28	1.13
3B	0.98	0.35	0.42	0.47	0.22	0.77	0.40	0.56	0.38	0.73
4A	2.19	1.68	1.58	1.72	1.66	1.10	1.47	1.08	1.20	1.50
4B	0.49	0.35	0.61	0.47	0.40	0.36	0.49	0.72	0.34	0.56
5A	0.89	0.44	0.34	0.24	0.31	0.41	0.31	0.42	0.57	0.40
5B	0.09	0.00	0.27	0.12	0.31	0.04	0.12	0.33	0.11	0.27
6A	0.70	1.14	0.42	0.36	0.22	0.16	0.19	0.42	0.30	0.37
6B	0.89	0.27	0.34	1.00	0.27	0.36	0.43	0.39	0.45	0.16
7	0.49	0.27	0.34	0.29	0.14	0.12	0.12	0.33	0.34	0.23
8	0.21	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00
TOTAL	14.25	11.91	11.39	11.22	10.29	9.87	9.50	12.14	10.16	9.97

TABLE 30

ADJUSTED MEAN ON DEVIATIONS BY LOW CAUCASIAN GROUP PER 1000 WORDS OF SPOKEN VOLUME

Grades Kindergarten through Nine
N = 21

	Grade									
Type of Deviation	Kindergarten	One	Two	Three	Four	Five	Six	Seven	Eight	Nine
1A	0.99	0.53	0.81	0.98	0.90	0.25	0.82	0.22	0.76	0.14
1B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.04
(1B)	0.87	2.01	2.17	2.32	1.61	1.16	1.80	1.86	1.49	1.60
1C	1.60	3.89	1.45	2.23	3.08	4.23	3.05	4.60	4.24	3.91
1D	3.34	1.07	1.53	2.05	1.18	0.60	1.15	0.49	0.27	0.40
1E	1.60	1.48	1.17	0.98	1.26	1.36	0.98	1.55	1.40	1.42
2A	1.25	2.83	2.08	2.05	1.67	2.42	2.02	6.33	6.31	5.16
2B	0.00	0.28	0.55	0.20	1.05	0.51	0.82	1.46	1.08	0.67
3A	0.12	0.66	0.81	0.48	0.77	0.60	1.58	1.90	1.85	2.14
3B	0.99	0.94	1.64	1.18	1.12	0.76	1.30	1.77	1.21	1.64
4A	3.95	4.02	2.08	3.00	2.72	1.41	2.29	2.79	2.57	3.38
4B	0.26	0.53	0.72	0.00	0.62	0.20	0.87	0.62	0.99	0.84
5A	0.61	0.81	0.19	0.98	0.07	0.25	0.87	0.88	1.40	1.11
5B	0.00	0.28	0.09	0.20	0.07	0.15	0.27	0.39	0.95	0.22
6A	0.49	0.66	0.81	0.87	0.84	0.45	0.65	0.31	0.72	0.62
6B	0.75	0.53	0.36	0.68	0.56	0.40	0.55	0.45	0.63	0.62
7	0.99	0.81	1.09	0.87	0.62	0.20	0.98	1.37	1.31	0.84
8	0.38	0.28	0.28	0.29	0.15	0.20	0.27	0.13	0.40	0.45
TOTAL	18.19	21.61	17.83	19.36	18.29	15.15	20.27	27.16	27.58	25.20

TABLE 31

ADJUSTED MEAN ON DEVIATIONS BY LOW NEGRO GROUP PER 1000 WORDS OF SPOKEN VOLUME

Grades Kindergarten through Nine
N = 21

Type of Deviation	Grade									
	Kindergarten	One	Two	Three	Four	Five	Six	Seven	Eight	Nine
1A	12.25	10.02	11.93	8.45	7.66	4.57	3.86	3.97	3.43	2.25
1B	0.43	0.47	0.50	0.45	0.28	0.13	0.00	0.17	0.00	0.00
(1B)	4.09	3.54	4.28	5.07	3.92	2.65	3.86	4.47	4.13	3.11
1C	6.61	3.08	4.28	4.51	3.35	5.87	6.85	8.01	7.37	5.51
1D	16.19	13.88	8.25	10.59	7.55	4.01	3.69	5.66	2.53	3.07
1E	4.49	4.01	3.25	2.82	2.80	3.27	2.58	3.11	4.73	4.02
2A	6.47	3.54	3.66	3.59	2.89	3.09	3.39	8.23	8.71	7.04
2B	0.00	0.15	0.21	0.24	0.28	0.19	0.29	0.60	0.35	0.76
3A	0.86	0.47	0.62	0.56	0.74	1.04	1.58	2.24	2.49	1.63
3B	2.81	1.09	0.91	1.14	1.21	1.67	1.35	1.91	1.65	1.96
4A	9.02	6.94	6.22	5.63	4.00	3.39	4.04	5.56	4.48	3.16
4B	0.13	1.23	0.72	0.56	1.31	0.74	1.29	2.67	1.45	1.15
5A	1.12	0.32	0.62	0.68	0.83	0.38	1.23	0.82	1.84	1.25
5B	0.86	0.00	0.31	0.24	0.00	0.31	0.36	0.38	0.50	0.38
6A	0.13	1.55	0.91	1.45	0.94	1.12	1.58	1.42	1.39	0.62
6B	0.00	0.62	1.63	0.90	0.94	1.36	0.93	1.90	2.09	1.15
7	2.25	3.54	1.94	2.48	2.43	1.91	1.23	2.84	1.79	2.39
8	3.24	2.46	2.25	1.90	2.23	2.29	1.87	0.87	2.00	2.25
TOTAL	70.95	56.91	52.49	51.26	43.36	37.99	39.98	54.83	50.93	41.70

1A Deviations

Agreement of subject and verb in the third person singular (excluding all forms of the verb to be).

Example: The boy don't look happy.

We have to see it because he want to see it.

My mother she look at television a lot.

One girl have a basket on her bike.

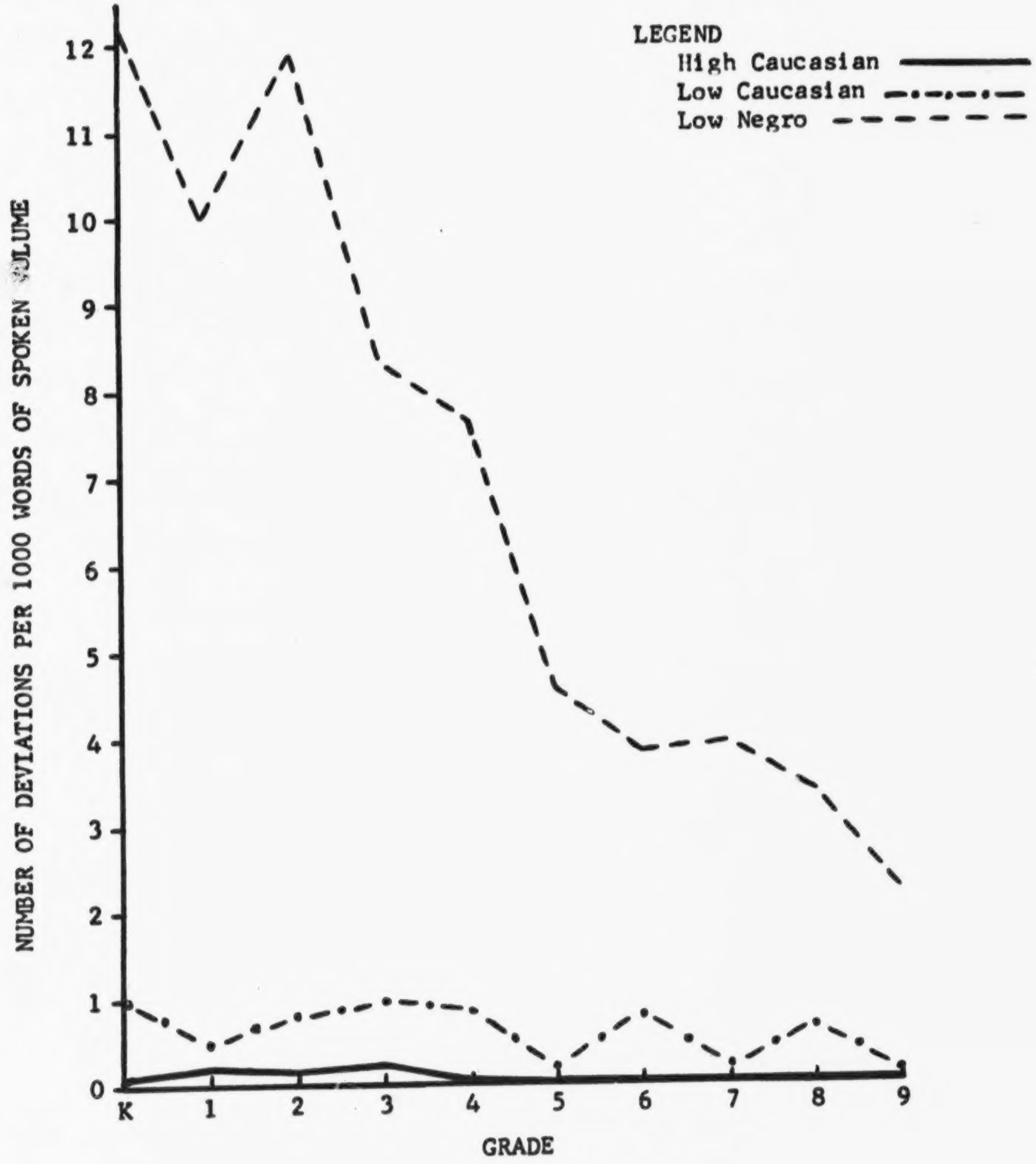
It look as if they're riding on the grass.

Comment: Agreement of subject and verb in the third person singular is one of the most prevalent deviations for the Low Negro group--particularly in the earlier years. Steady improvement has been made by the Low Negro group from kindergarten through grade nine (with the exception of a jump in grade two). This deviation is a minor problem for the Low Caucasian group; the High Caucasian group never encounters any difficulty.

FIGURE 9

NUMBER OF 1A DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine



N = 21 for each group.

1B Deviations

Agreement of subject and verb for all forms except the third person singular (again excluding all forms of the verb *to be*).

Example: They *runs* down the street.

The two little girls *looks* at the little boy.

She asks him while they *walks* home from the movie.

We *likes* to ride our bikes in the park.

You *turns* that machine on too fast.

Comment: The incidence of this deviation was virtually nil for all three groups. As a result, *no graphic presentation has been made*.

(1B) Deviations

Agreement of subject and verb using only forms of the verb *to be*.

Example: I *is* going outside.
It *were* a boy who came yesterday.
They *was* here before you came.
There *was* three girls.
There *is* two dogs.
I thought you *was* going to ask me that.
The girls *is* diving and swimming.
One of the kids *are* riding in the weeds.
You *is* my best friend.
She asked him what he *were* doing.

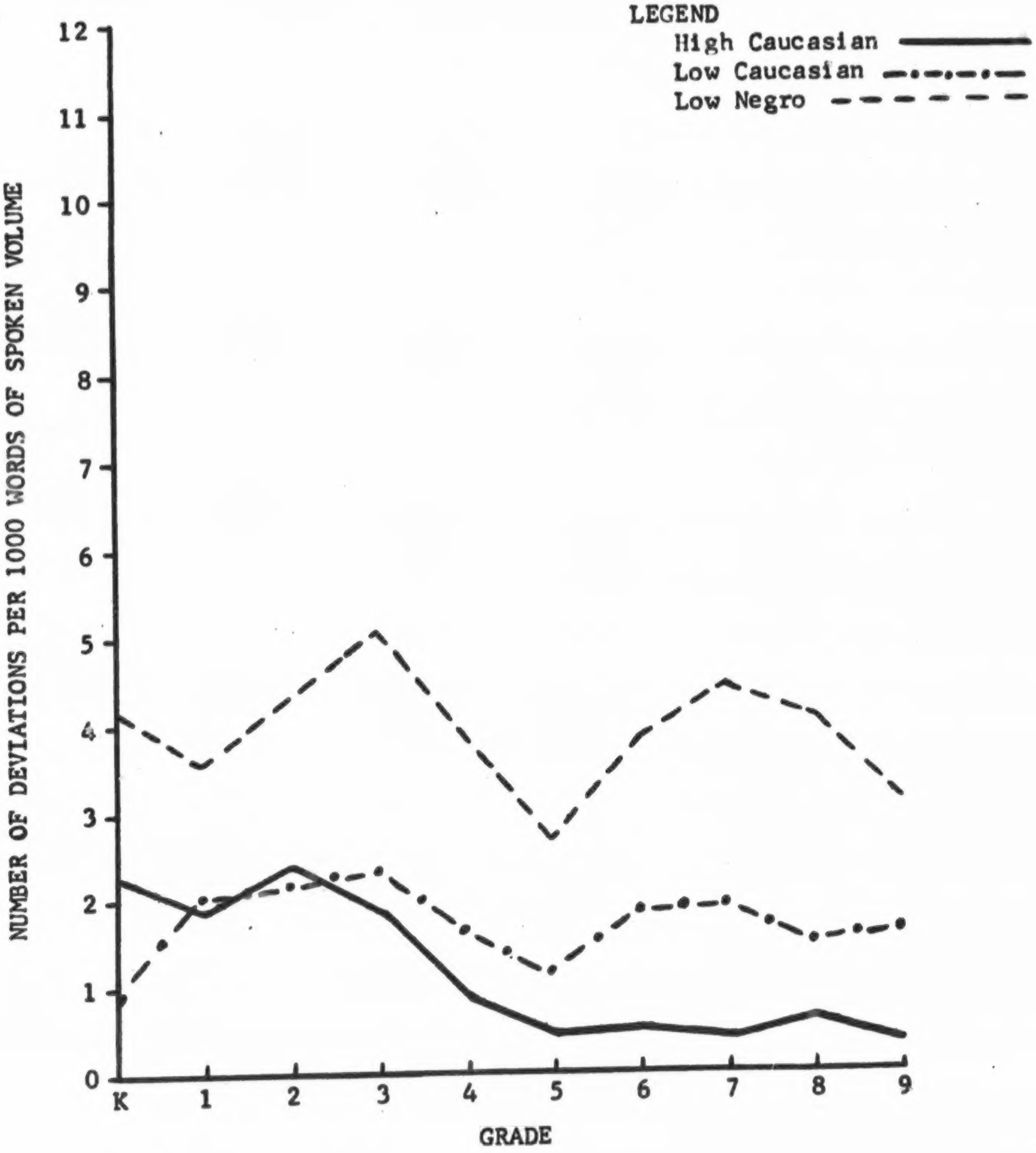
Comment: All three groups have difficulty with this deviation during the early years with the Low Negro group having a persistent difficulty throughout the ten-year period. The Low Caucasian group makes some improvement, but the improvement is relatively minor. The High Caucasian group makes considerable improvement and their incidence for this deviation is virtually nil from grade five through grade nine.

For the High Caucasian group the problem with this deviation occurs mainly in cases illustrated by the fourth and fifth examples above, and after grade five no problem exists. For the Low Caucasian and Low Negro groups the problem is with *all* of the examples cited above. Both low groups seem to conquer most problems illustrated, but they persist in making the deviation shown in the fourth and fifth examples. In other words, both low groups learn to use the verb *to be* when it is preceded by a personal pronoun or a noun, but they continue to encounter difficulty when the word *there* precedes the verb *to be*.

FIGURE 10

NUMBER OF (1B) DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine



N = 21 for each group.

1C Deviations

All verb problems concerned with consistency in the use of tense.

Example: He fell and skins(ned) his knee.
One time when I was sick, my mother comes in to see me.
She knew if she does something bad he would find out.
She drew on him, and the man shoots her.
When the fish are jumping up, you could see the white water.
He went to the church and starts playing his violin.

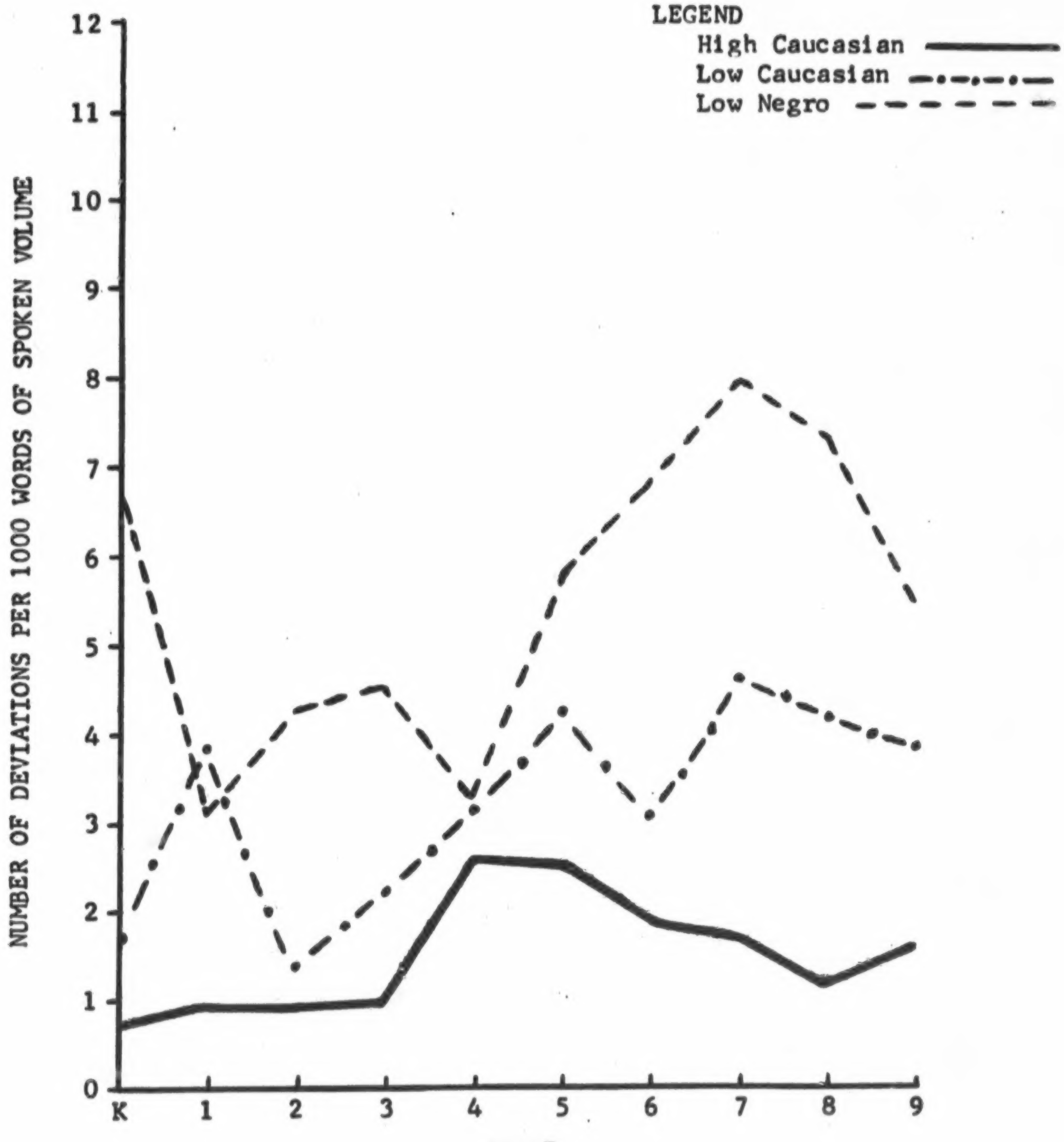
Comment: The Low Negro and Low Caucasian groups have a rather erratic pattern with tense deviations. They have a persistent problem with tense from kindergarten onward and actually have an increasing problem in the later years with the Low Negro group having more of a problem than the Low Caucasian group. In the early years the Low Negro and Low Caucasian groups had substantial tense deviations when using simple tense structures. In later years their difficulties are centered in more complex tense structures and in switching back and forth between present and past tense when using long passages of uninterrupted speech (giving a long description of the picture used in the interview or a lengthy explanation of a book they have read).

For the High Caucasian group the pattern is quite different. In the early years the High Caucasian group experienced very little difficulty with simple tense structures. They had an abrupt increase in this deviation in grades four and five, basically as a result of early experimentation with complex tense structures. After grade six the problem seems to be coming under control although they still have some tense difficulties and show a minor increase in grade nine.

FIGURE 11

NUMBER OF 1C DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine



N = 21 for each group.

1D Deviations

Omission of auxiliary verbs.

Example: He (is) running away.

He (has) been here.

I guess if he wanted to, he (could) do it.

The boy (is) going to the store.

It looks like there were two of them who (were) running.

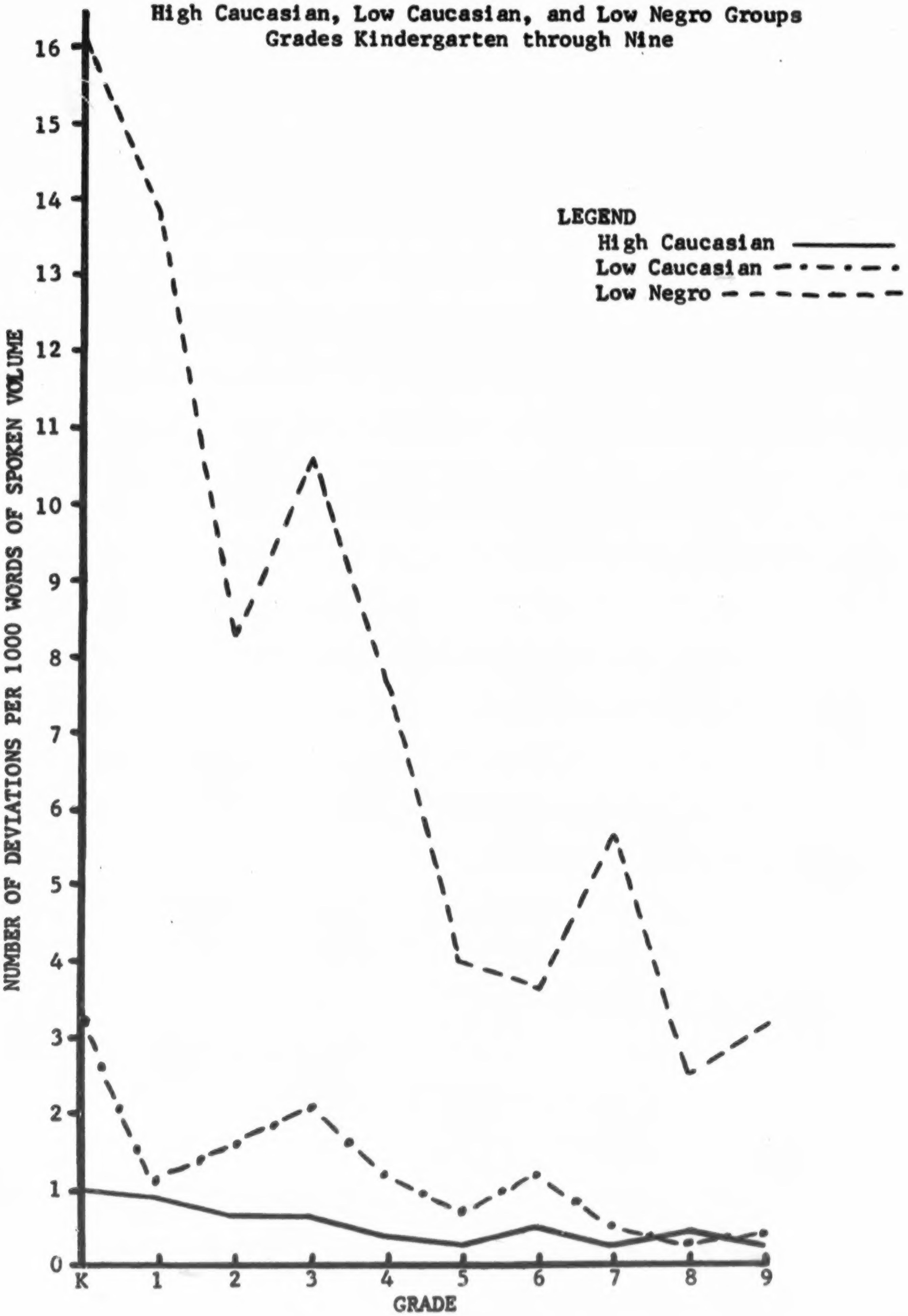
They (are) just clapping their hands for joy.

Comment: Omission of auxiliary verbs can best be described as follows: for the Low Negro group, an extreme problem which is steadily being brought under control over the ten-year period; a relatively minor problem over the ten-year period for the Low Caucasian group; an insignificant problem for the High Caucasian group after grade three although some difficulty was experienced in the early years.

FIGURE 12

NUMBER OF 1D DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine



N = 21 for each group.

1E Deviations

Nonstandard verb forms.

Examples: He has ate.
I was laying in bed.
I seen him yesterday.
They rided their bicycles to the store.
She told him why are you doing that?
So when he got about seventeen years old, he wanted to work.
In the tennis matches she won a lot of people.
He had ran away before they got there.
They snuck up the stairs.
She bes my friend.

Comment: In this case, acceptable colloquial expressions with which a few English teachers might find fault--such as (1) got for has or have, (2) hadn't ought for shouldn't, (3) use of was instead of were for supposition, etc.--have been disregarded.

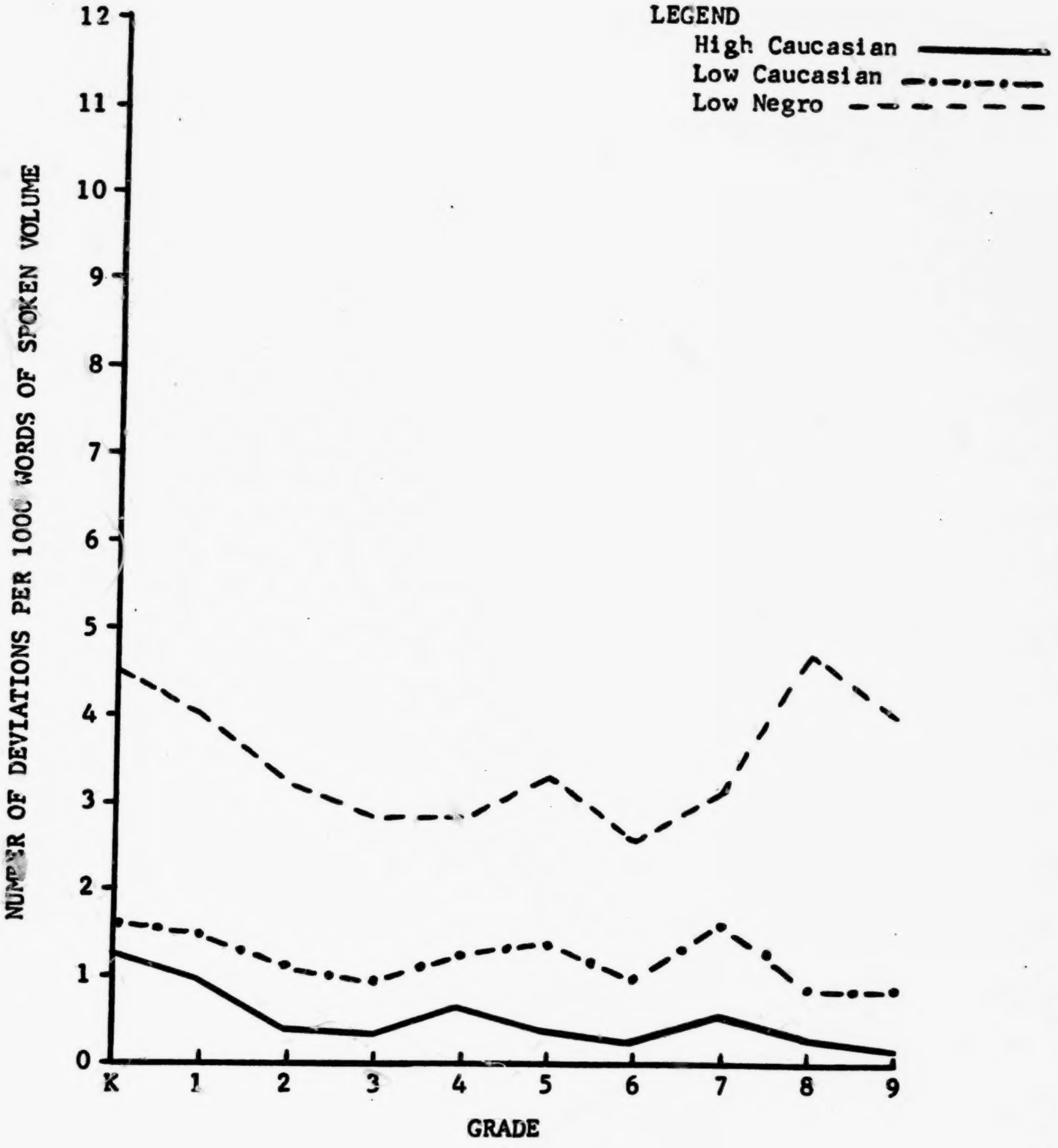
Both Caucasian groups have a steady but relatively minor problem with nonstandard verb forms with the High Caucasian's problem being almost nil. The Low Negro group has considerable difficulty with this deviation from kindergarten through grade nine and actually shows an increase for grades seven and eight.

An interesting aspect of this deviation is that during the early years the most frequent type of 1E deviation was the use of verb forms not actually existing in the English language, such as he ranned instead of ran. (The child, of course, is logically assuming a regularity which the English language does not always follow.) In later years the subjects have learned to use the accepted words; their deviations are now mainly a difficulty with the standard use of the past participle, such as he has ran instead of run.

FIGURE 13

NUMBER OF 1E DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine



N = 21 for each group.

2A Deviations

Nonstandard or confusing use of pronouns.

Example: *They* eyes are blue.
Her went to town.
He did it by *hisself*.
The man *she* sent her back to prison.
They were waving at *them* while *they* rode by.
My sister and *them* went with me.
They did the work *theirself*.
She went to *she* house.

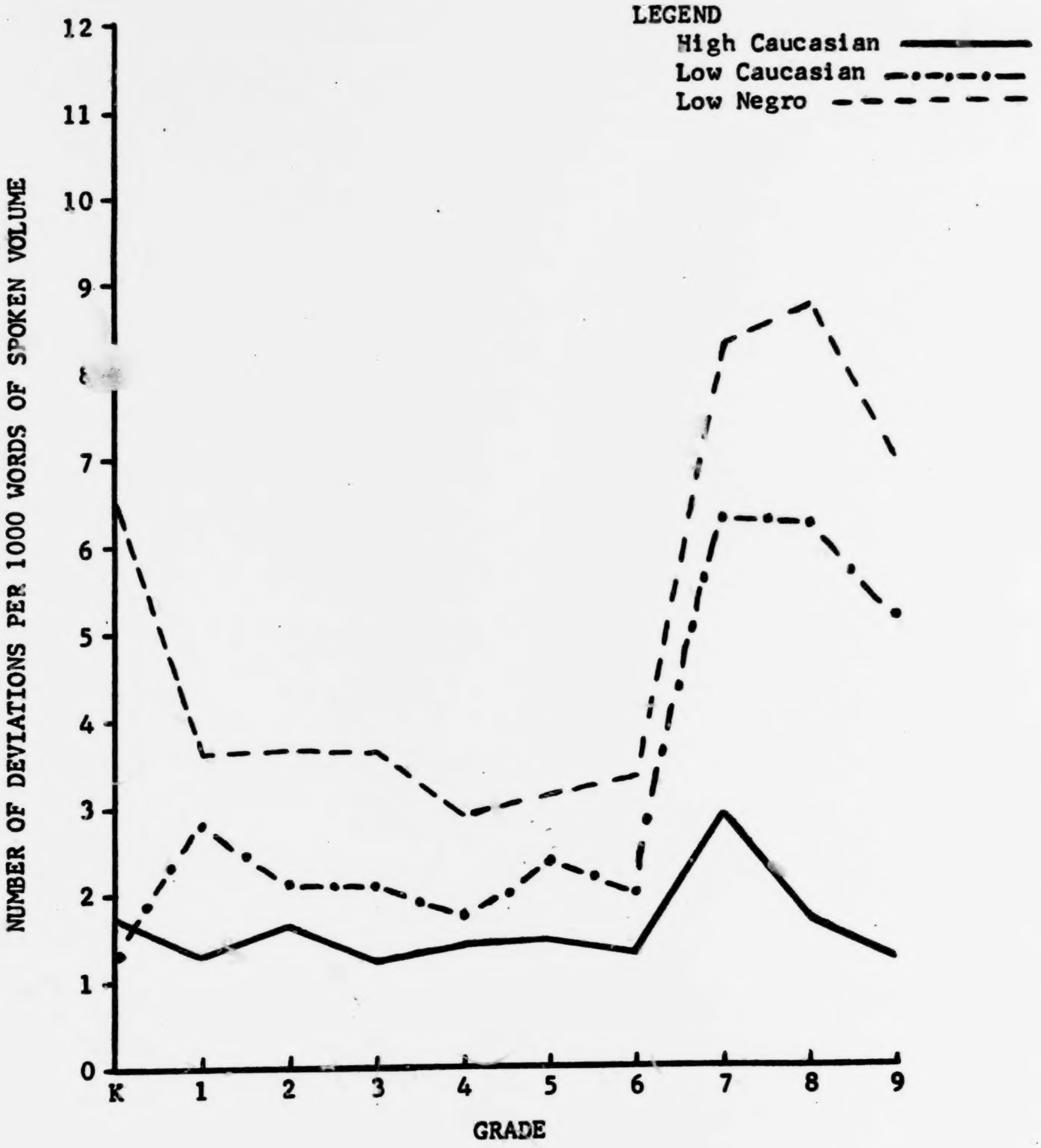
Comment: At the outset the Low Negro group had a significant problem, most often illustrated by a *confusion of sex of the pronoun as related to the antecedent*. All three groups have a problem with the use of pronouns and the same pattern between the groups is evident: the Low Negro group has the greatest difficulty; the Low Caucasian group has less difficulty; and the High Caucasian group has still less difficulty.

All three groups show an abrupt increase in this deviation in grade seven with the problem persisting for both Low groups in grades eight and nine. The pattern for these latter years (grades seven, eight, and nine) is failure to make sufficient distinctions, such as using the identical pronoun to refer to several people in the story being told: for example, *He gave him the horse he had asked him for*. This ambiguity with pronouns is a common problem in English speech.

FIGURE 14

NUMBER OF 2A DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine



N = 21 for each group.

2B Deviations

Use of that instead of who as a relative pronoun referring to persons.

Example: I saw the man that I knew.

There goes the girl that is running away.

Comment: This deviation was slight and showed an erratic pattern for all three groups, and as a result it has not been presented graphically. It is interesting to note, however, that the Low Negro group has the lowest incidence of this deviation. This apparently results from the Low Negro group's use of fewer relative clauses than either of the Caucasian groups. This conclusion is based on the fact that the Low Negro group consistently has a lower average words per unit than either of the Caucasian groups. (See Table 4.)

The work of Bernstein[1] and the findings of the present study indicate that low socio-economic groups, regardless of race, do not elaborate sentences as much as do middle and upper socio-economic groups. They do not use language as often to analyze or synthesize concepts or to consider relationships, and as a result they use fewer subordinate clauses, appositives, infinitives, and phrases of all kinds.

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[1] Bernstein, *op. cit.*

3A Deviations

Ambiguous placement of a word, phrase, or clause.

Example: I *only* saw one boy.

The man is blowing a horn *with a hat on*.

That big house was for all these Caucasian and Negro people *mixed*.

The curtains were hanging up *and shades*.

Lloyd we have to see it because he likes to see it.

When I come home I wish my sister would stop hanging on me.

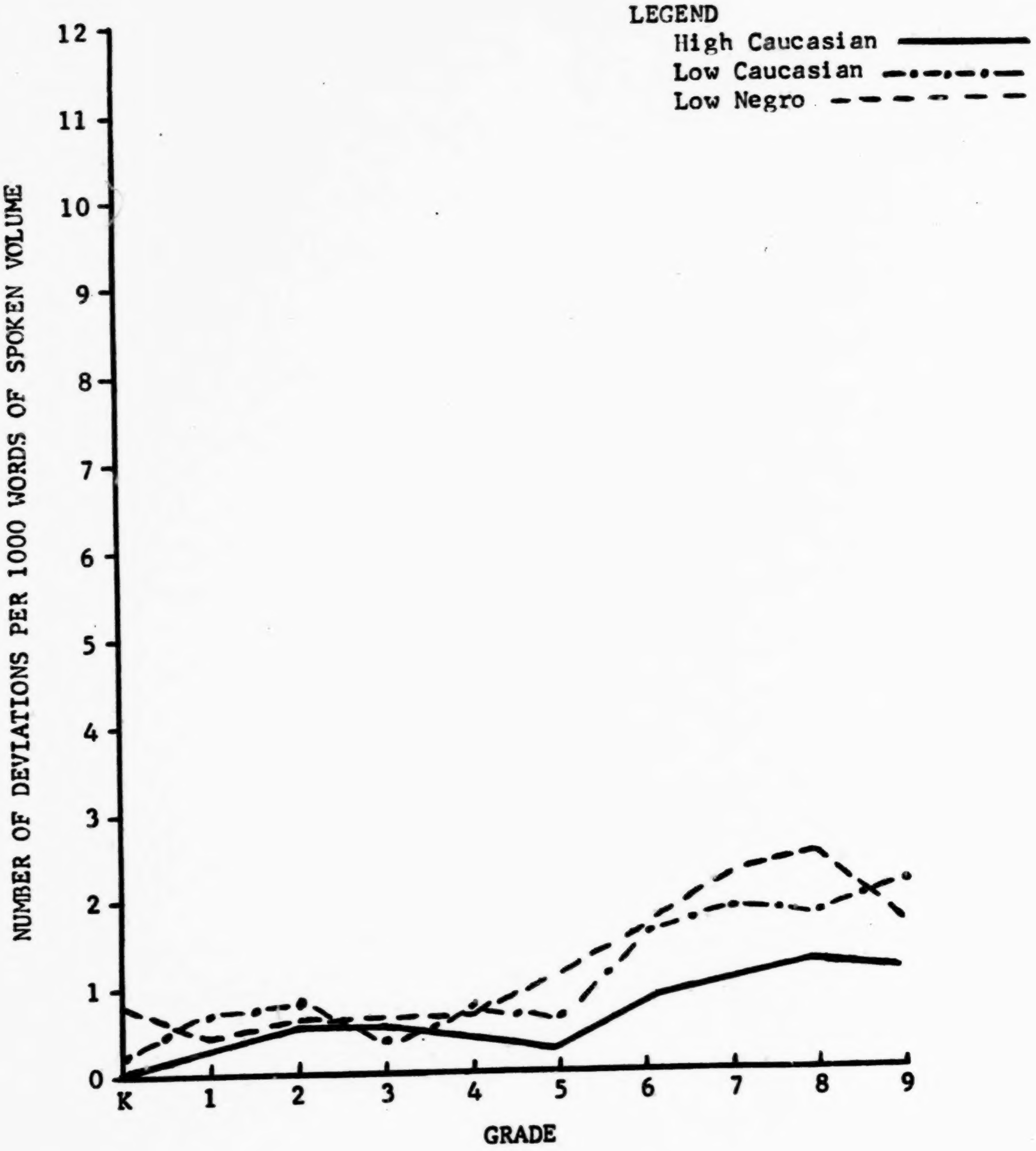
He put his pajamas and coat and slippers *on*.

Comment: This deviation was a minor problem for all three groups until grade six. At that point and throughout grades seven, eight, and nine, all groups experienced more difficulty. This seems to be the result of an increase in complexity of sentence structure as the subjects grow older--more complexity offers more probability of a misplaced modifier. An interesting aspect of this deviation is that the High Caucasian group shows less difficulty than either of the Low groups *in spite of the fact* that the High Caucasian group always uses more complexity and has a higher words per unit average.

FIGURE 15

NUMBER OF 3A DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine



N = 21 for each group.

3B Deviations

Awkward arrangement, incoherence, or critical omission (for example, of both subject and predicate).

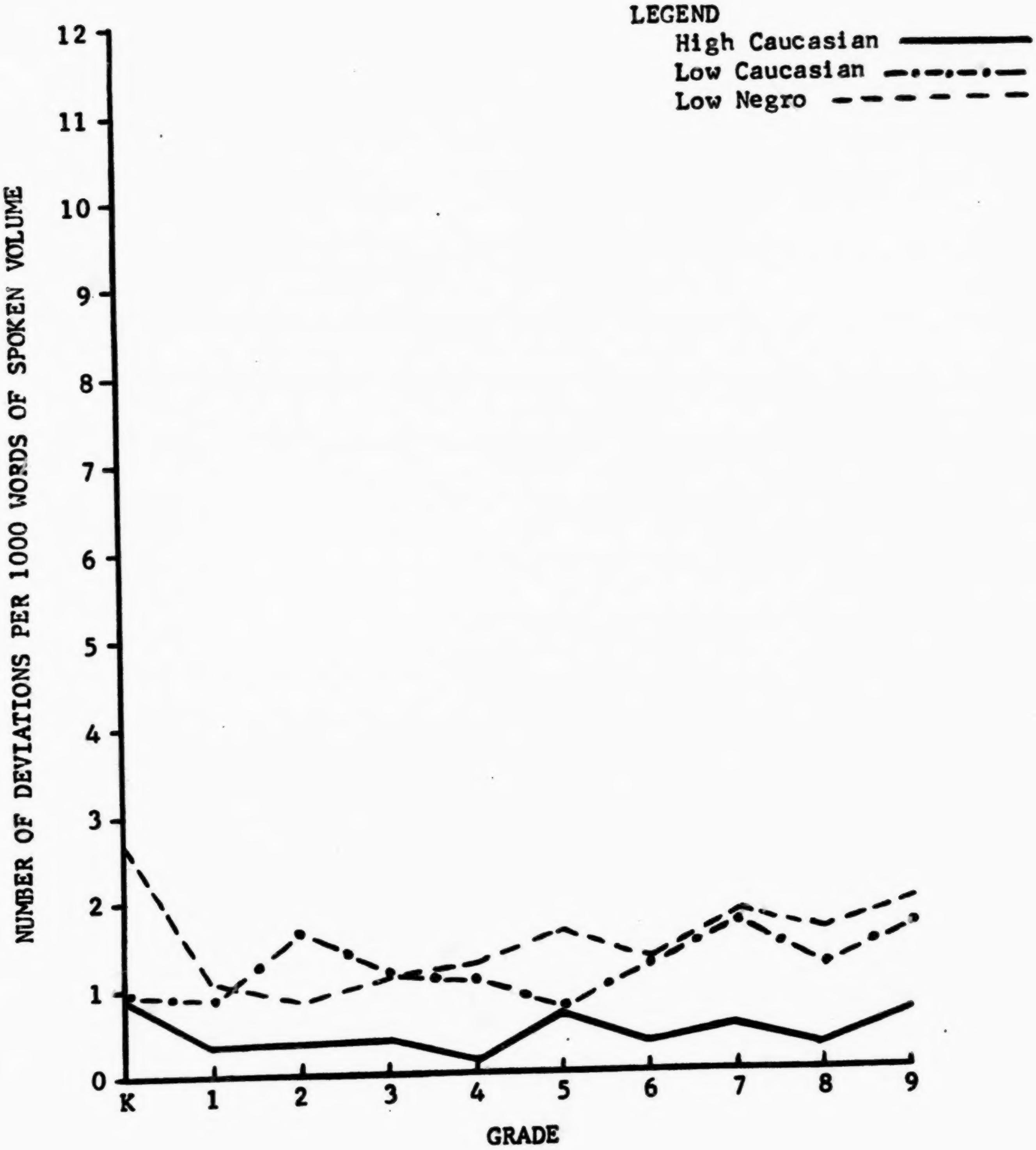
Example: A couple of weeks is school out.
The girl (is going) to the store and buying soda.
And mine broken my leg of the doll.
You make a circle with everybody go in.
Everyone wanted him deputy to make.
He signals to all the pitchers in these games what he'd hit and win.

Comment: This deviation is an insignificant problem for the High Caucasian group. The Low Negro group has some problem in kindergarten, but then reduces the problem to about the level of the Low Caucasian group. Apparently, a subject classified as "low" becomes more confused more easily than one classified as "high," regardless of ethnic origin. However, it should be borne in mind that the spread between all three groups is not very great.

FIGURE 16

NUMBER OF 3B DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine



N = 21 for each group.

4A Deviations

Careless omission (except auxiliary verbs).

Example: She asked (the) girl for some money.
She didn't want him (to) know she was there.
A little man is blowing (a) horn.
He slipped (out of) the house with his violin.
He was waiting (for) his mother and father.
(The) dog was running around in front of the house.

Comment: From kindergarten through grade five, the Low Negro group has considerable trouble with careless omissions, but slowly brings the problem under control. However, members of this group show an increase in this deviation for grades six and seven, and by grade nine they have reduced their incidence of careless omissions only to the point they had achieved in grade five.

The Low Caucasian group has less difficulty than the Low Negro group, but shows a persistent increase from grade six through grade nine.

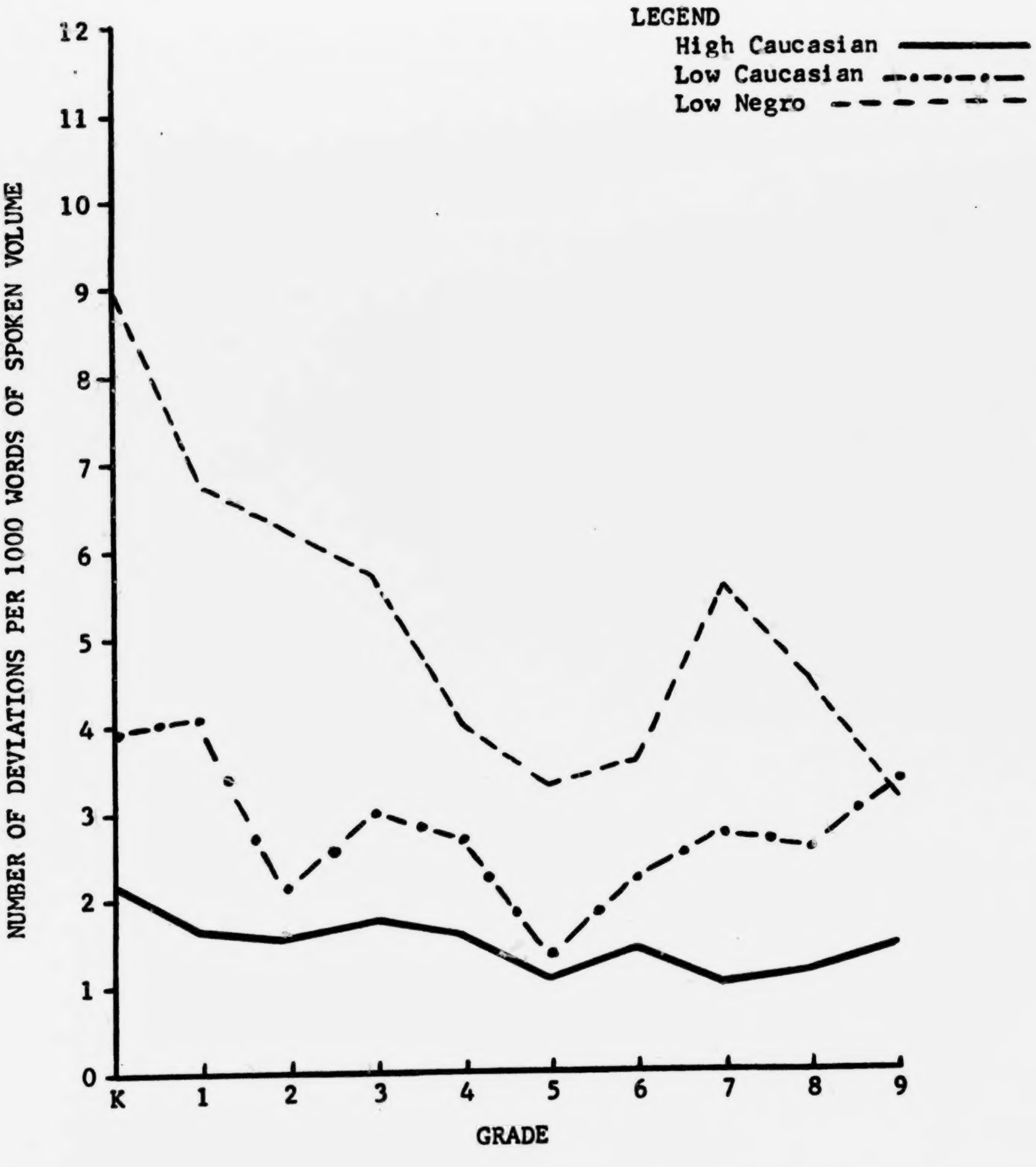
The High Caucasian group has less of a problem than either of the Low groups, but the problem is a steady one from kindergarten through grade nine.

Actually, an explanation of the somewhat erratic graphic presentation cannot be given statistically, but it can be given from first-hand observation of the subjects. In early years careless omissions were actually "committed" because of an inadequate ability to use language. In later years the subjects seem more at ease with language but have grown careless in their speech habits.

FIGURE 17

NUMBER OF 4A DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine



N = 21 for each group.

4B Deviations

Unnecessary repetition.

Example: I go you know to buy ice cream you know at the store.
And he told me to take it very often he said.
They had on hats and different clothes on.
Well this George he was well kind of shy.
He got proof that again his swing was good again.

Comment: This deviation shows an erratic pattern and is quite minor for all groups (just barely worthy of being presented graphically). However, it should be noted that repetitions of the subject, such as Jim he went out or the little girl she got a bunny, were not counted as deviations. These are considered statements of topic and in adult speech emerge as frequent and fairly acceptable usage; e.g., The man who brings our newspaper every morning, well, he's not my ideal example of promptness.

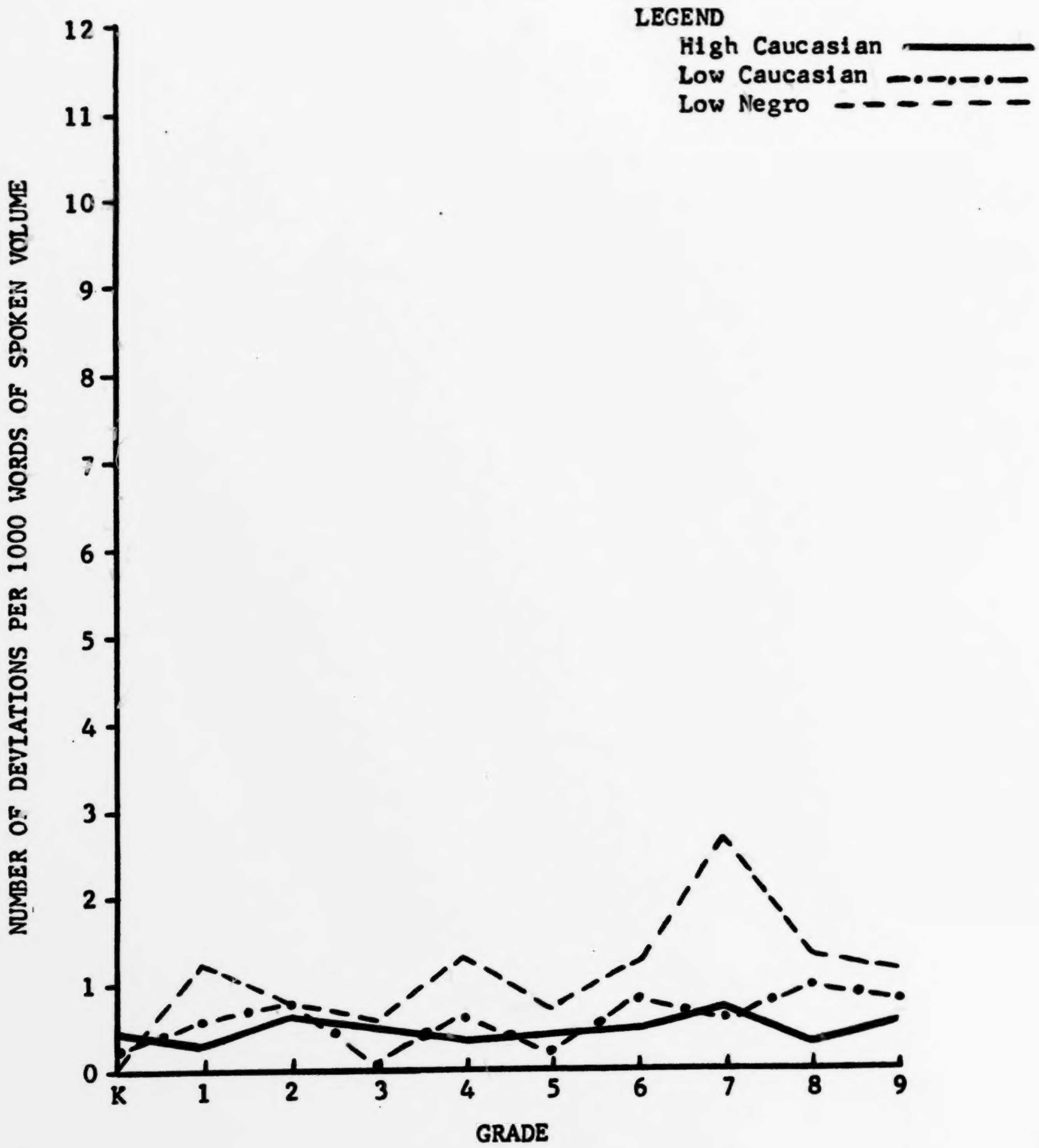
The abrupt increase by the Low Negro group in grade seven seems to be the result of a large number of Low Negro subjects constantly repeating phrases such as "you know." This phrase (you know) seems to be a junior high school phenomenon among many subjects; however, the process of subtracting the two extreme figures from all deviations eliminated an increase of this sort by either of the Caucasian groups. Actually, the worst offender with repetitious "you know" phrases was a boy in the Low Caucasian group. In the eighth grade he used this phrase unnecessarily a total of sixty-four times. In other words, he actually said "you know" over 128 times in a transcript of 1314 words.

The use of such phrases may very well be the response to linguistic inadequacy by persons who recognize the need to communicate better but lack the skills to do so.

FIGURE 18

NUMBER OF 4B DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine



N = 21 for each group.

5A Deviations

Nonstandard use of prepositions.

Example: We drove to (from) Utah to Texas.

Bud went back at his home.

Some children are in bicycles.

That book looks different than mine.

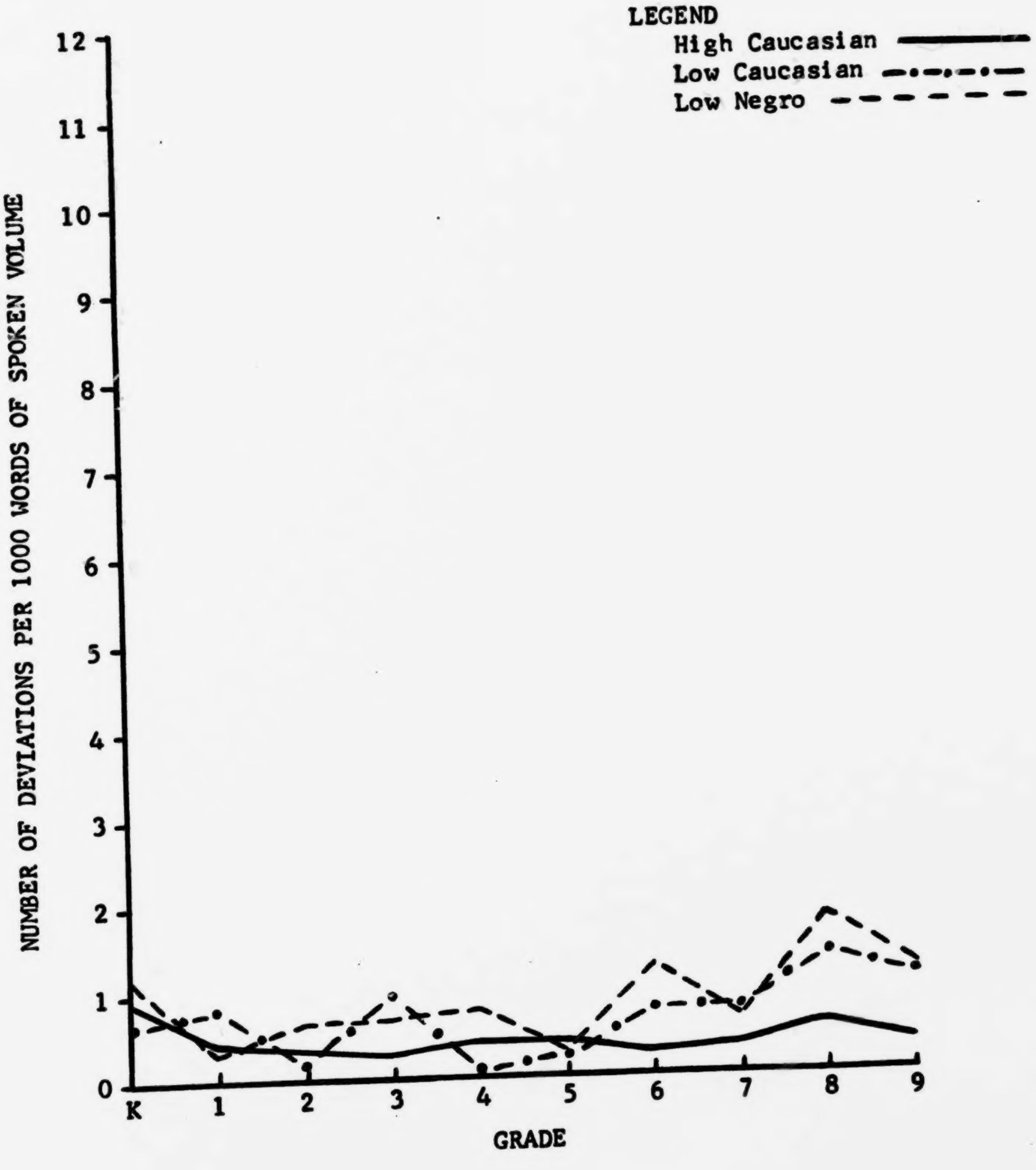
He had no control to the boat.

Comment: This deviation shows an erratic pattern and is quite minor for all three groups from kindergarten through grade five. For the two low groups after grade five there is a slight upward trend which seems to be a result of using a higher average words per unit--using more prepositional phrases and thus increasing the probability of a deviation.

FIGURE 19

NUMBER OF 5A DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine



N = 21 for each group.

5B Deviations

Nonstandard use of conjunctions.

Example: He went in the room when (where) she was.

They asked what (why) he was playing the music for.

I wish if (that) I don't die or anything.

She wanted to go to the party, but (and) so she went.

His mother told him not to cry, and (but) he did.

Comment: This deviation was insignificant for all three groups and therefore has not been presented graphically. However, it should be mentioned that children use conjunctions other than and and but rather infrequently.

6A Deviations

Nonstandard use of adjectives.

Example: He saw a airplane.

That girl is more pretty than the other one.

That is the winner, and that is a (the) loser.

He went home because he felt badly.

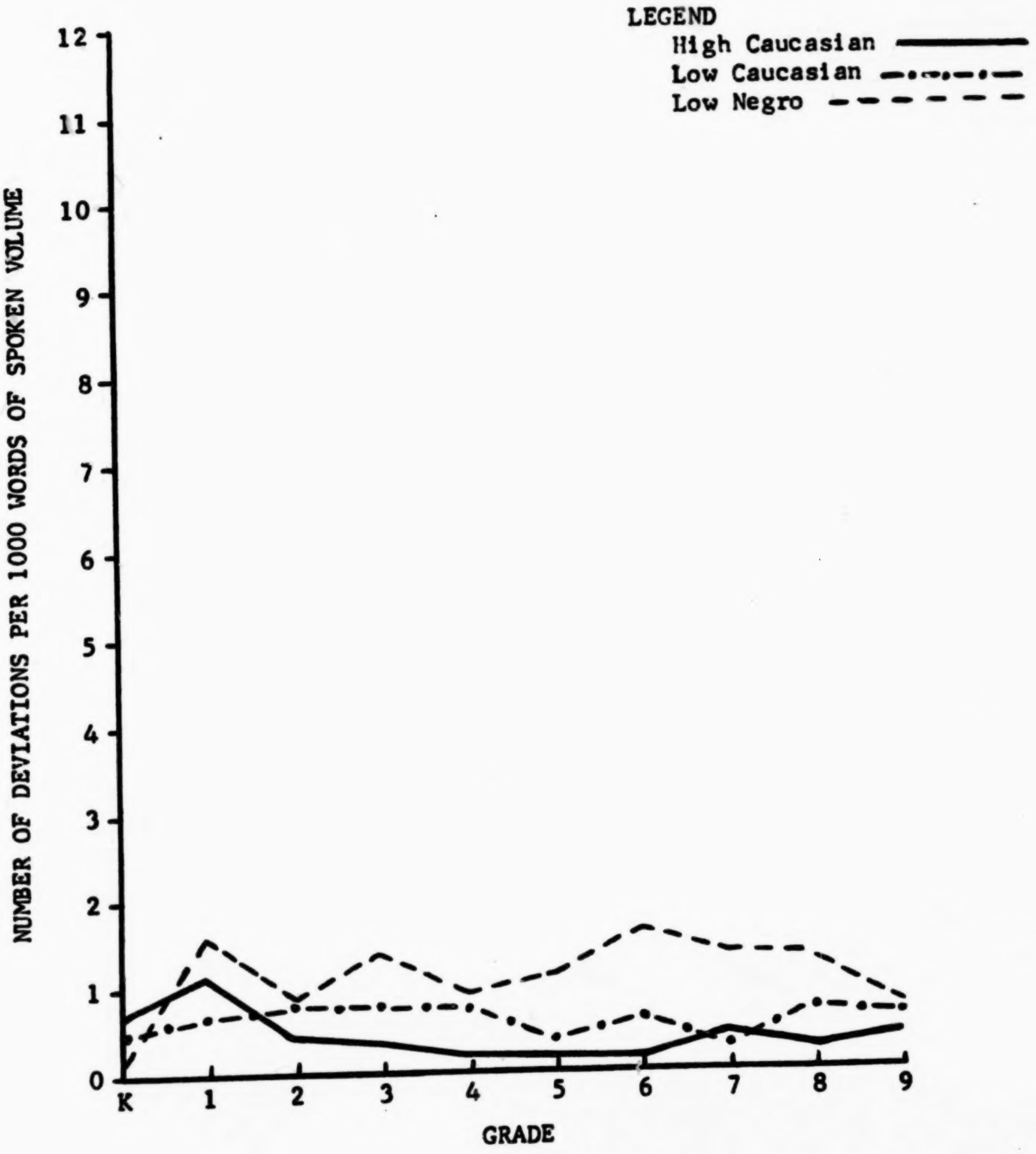
I would like to play with the youngest of those two girls.

Comment: Problems with adjectives are relatively minor for all three groups. The major incidence of this deviation is in the Low Negro group and is usually concerned with the use of a and an.

FIGURE 20

NUMBER OF 6A DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine



N = 21 for each group.

6B Deviations

Nonstandard use of adverbs.

Example: I sometime watch the fights.

This girl knew that man very much.

I guess he arrived quick.

He sure was happy.

That lady treated her cruel.

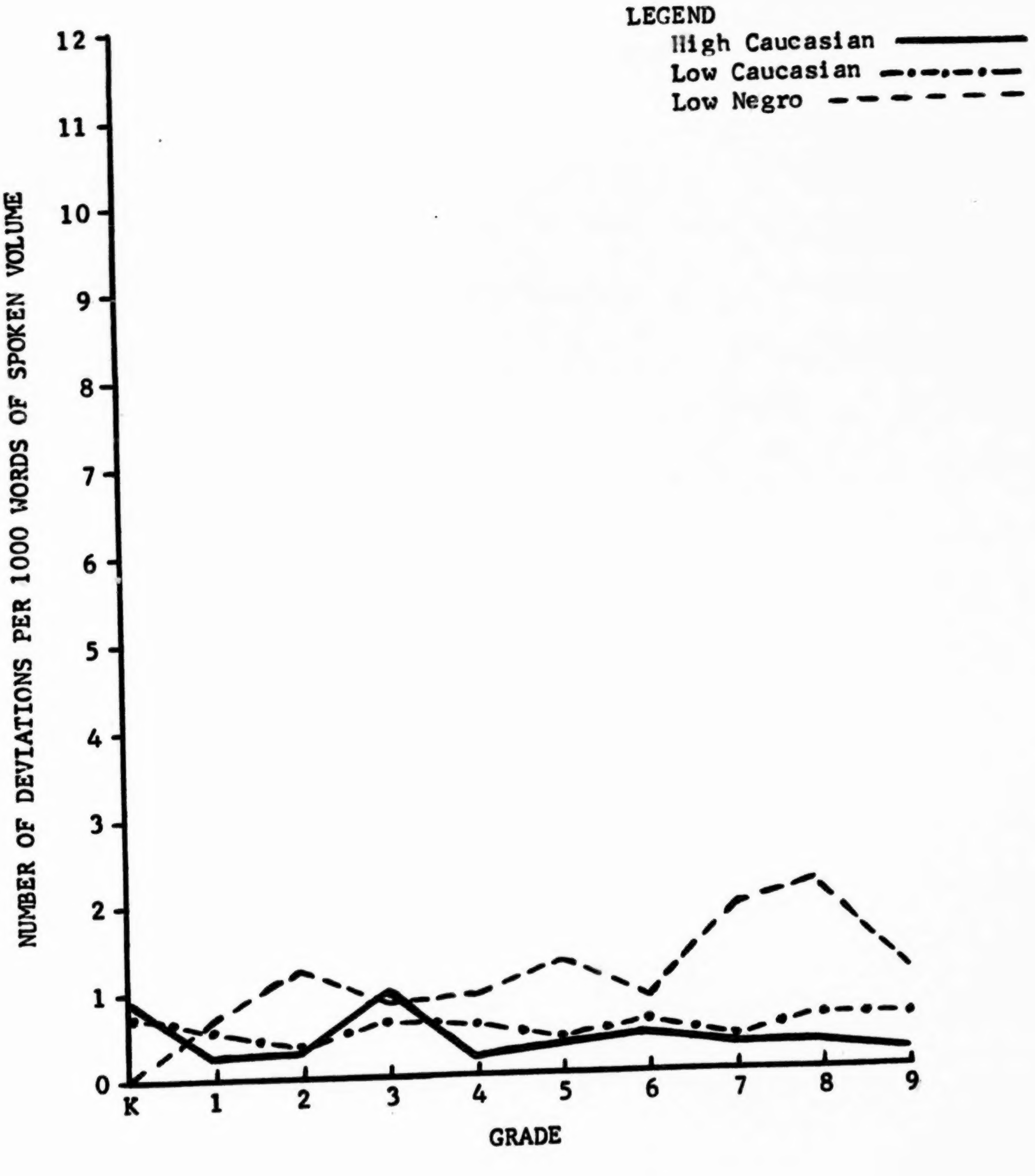
I can swim good enough.

Comment: With the exception of grade three (for the Low Caucasian group), this deviation is a relatively minor problem for both the High Caucasian group and the Low Caucasian group. The Low Negro group shows no evidence of the deviation in kindergarten, but from that point onward the members of that group have a steady and persistent problem. Their major problem is the omission of the s at the end of the word sometimes.

FIGURE 21

NUMBER OF 6B DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine



N = 21 for each group.

7 Deviations

Nonstandard noun forms.

Example: I see two mans.

The people are all wearing masses (masks).

The movie was a western about the calvary (cavalry).

The sharps (sharks) are jumping out of the water.

A police (man) comes and asks what the trouble is.

That little girl is holding a mice.

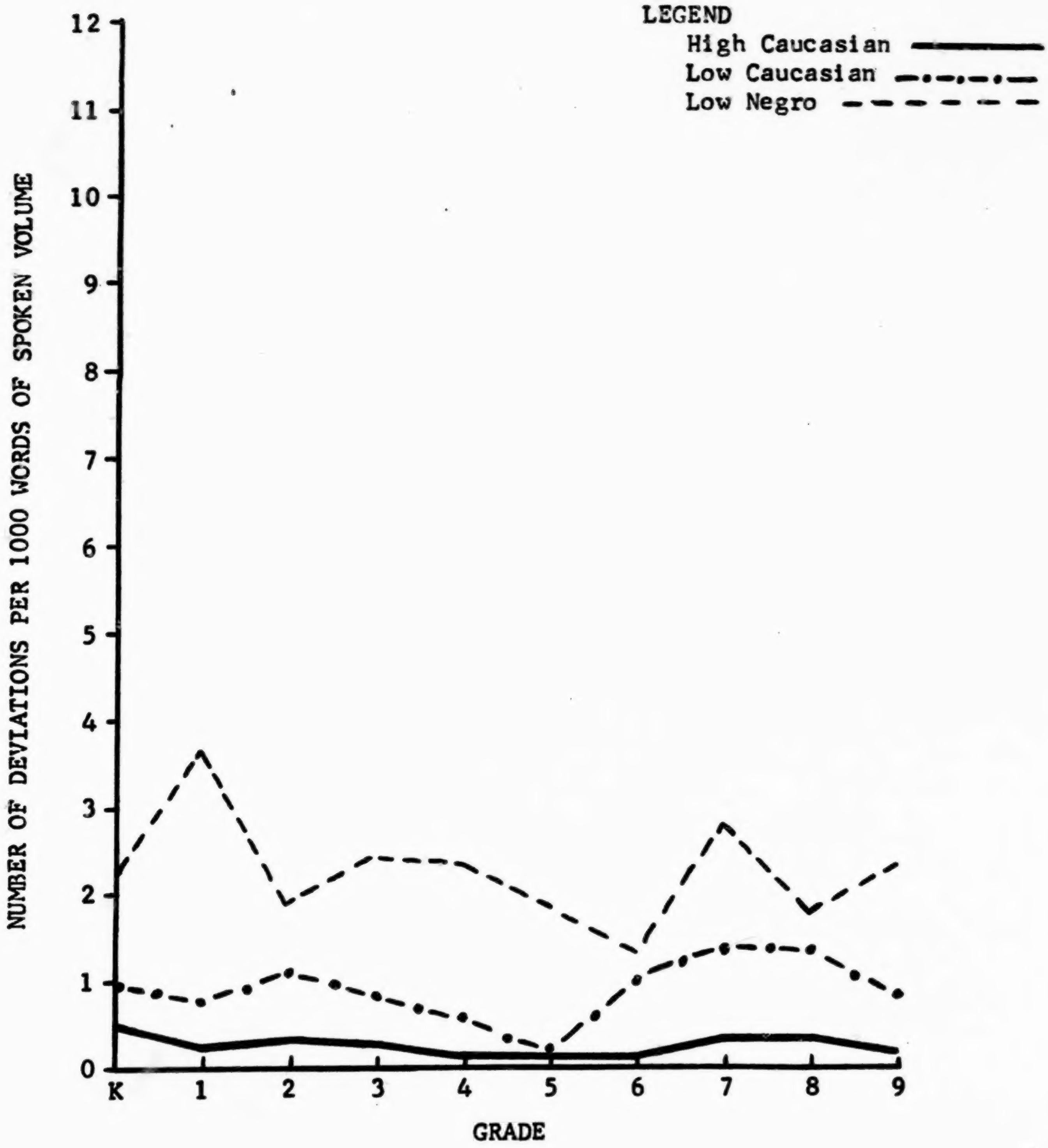
Comment: The High Caucasian group never has any difficulty with nouns. The Low Caucasian group shows little difficulty but exhibits an upward trend after grade five. The Low Negro group shows a persistent problem from kindergarten through grade nine.

In later years (after grade five) both low groups exhibit a different type of problem from that which they encountered in earlier years. They succeed in conquering such simple words as men rather than mans, but they increase their deviations on more complicated words. For example, they will say calvary when they mean cavalry, masses when they mean masks, etc. These are not problems of forming the plural of the noun but rather problems of substitution. These types of difficulties, of course, vary considerably for each subject and seem to indicate that the subject is over-reaching his vocabulary or does not have more difficult nouns clearly in his grasp. It is possible to argue that this category is one of vocabulary accuracy rather than one of standard usage.

FIGURE 22

NUMBER OF 7 DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine



N = 21 for each group.

8 Deviations

Double negatives and possessives.

Example: I don't know nothing.

If it wasn't for him, we wouldn't have no music.

There wasn't nobody coming to see him.

I wasn't allowed to go noplace.

I don't never want to die.

They wouldn't give her none of the food.

We had a week vacation.

We ride in my mother car.

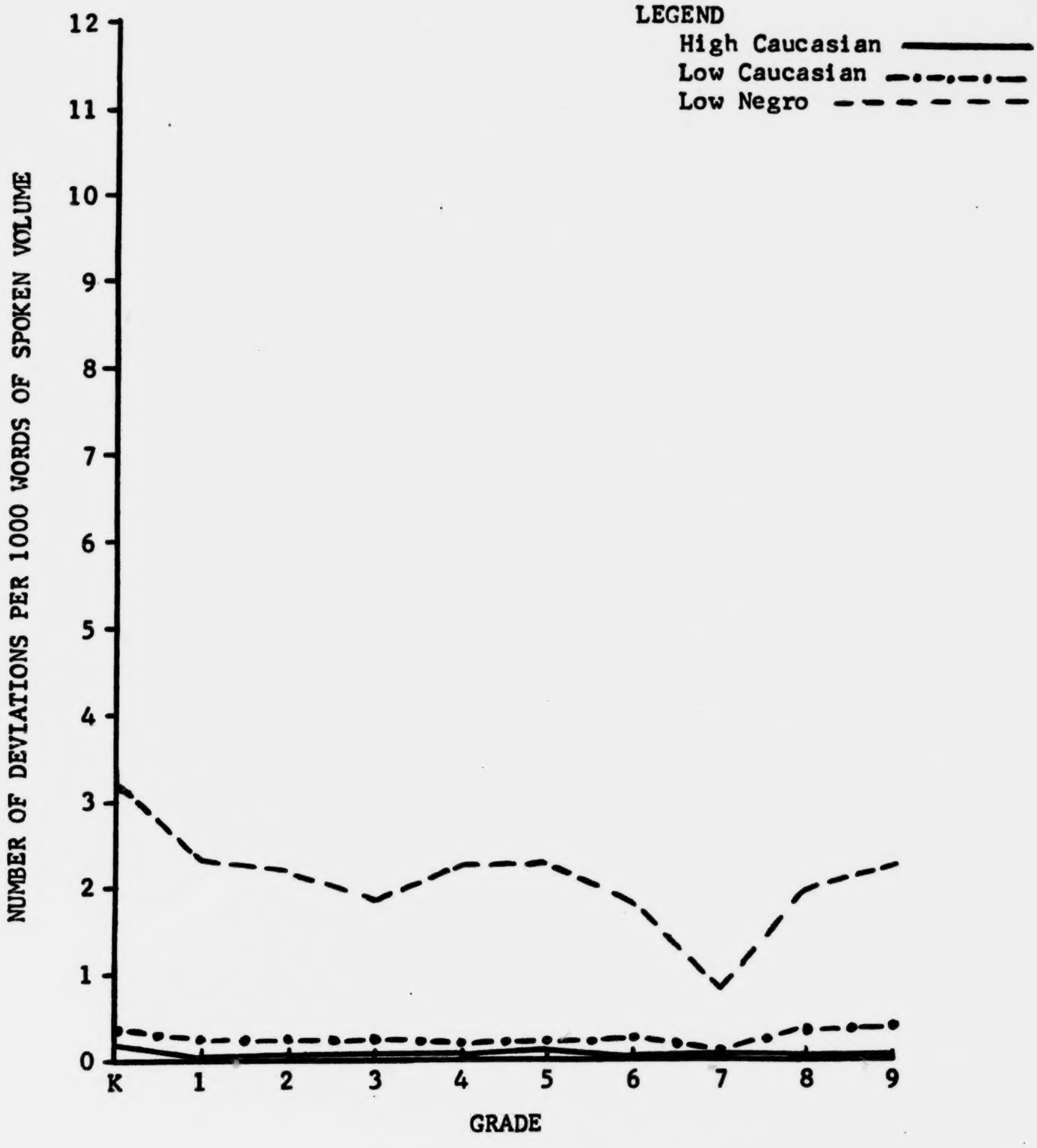
That is the girl hand.

Comment: Neither of the Caucasian groups has any difficulty with double negatives or possessive forms. The Low Negro group has a persistent problem with all examples illustrated, but by far the more prevalent deviation is the use of double negatives.

FIGURE 23

NUMBER OF 8 DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine



N = 21 for each group.

Total Deviations

Total deviations (Figure 24) are simply a summation of the separate deviations, most of which have been shown on individual graphs. (See Tables 29, 30, and 31 for the adjusted means on these deviations as well as on the deviations which were so minor that they were not presented graphically.) As can be seen, the Low Negro group shows steady improvement through grade five but then abruptly increases its deviations, not achieving the fifth grade level again until grade nine. The Low Caucasian group shows a similar abrupt increase after grade five and remains at a high level through grade nine. The High Caucasian group shows a slight but steady downward trend until grade six and then moves upward slightly in grade seven. For both low groups, the dip in the curves followed by an abrupt upward trend in the total number of deviations seems to indicate that as complexity of sentence structure and total volume of spoken language both increase, there is a more than proportional probability of committing certain deviations. In other words, it makes no logical sense to assume that both low groups suddenly grow more inept in the use of language after grade five. The pattern seems to be that they speak with more complexity and at greater length, but they have great difficulty in doing so.

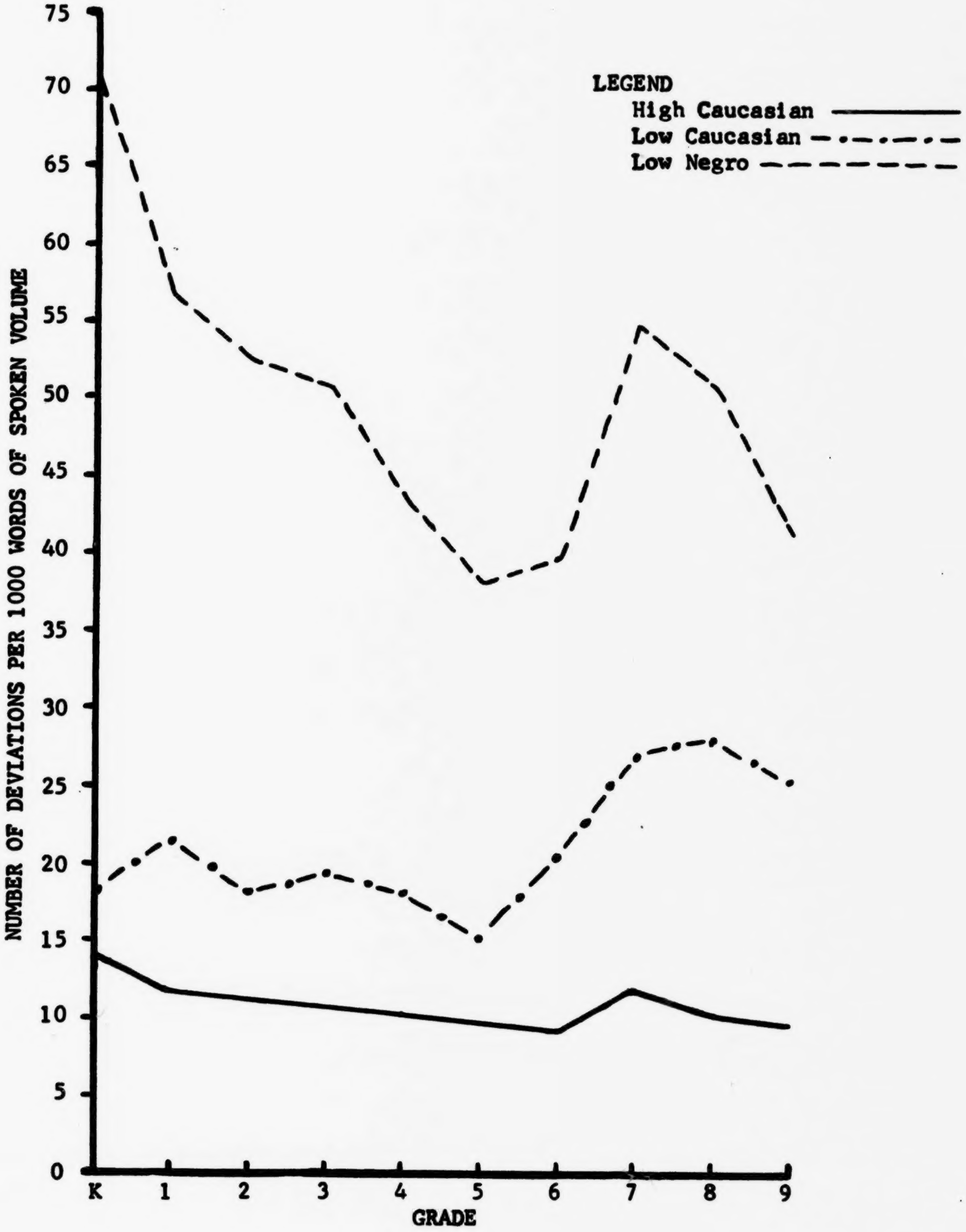
Total Deviations with 1A, 1D, 1E, and 8 Subtracted

Certain deviations from accepted usage are obviously a tremendous problem for the Low Negro group while a minor problem for both Caucasian groups. Specifically, these are deviations concerned with (1) agreement of the subject and verb in the third person singular, (2) omission of auxiliary verbs, (3) use of nonstandard verb forms, and (4) double negatives and possessives. Figure 25 shows the result in total deviations when those deviations of ethnic origin are subtracted on a year-by-year basis for all three groups.

FIGURE 24

TOTAL NUMBER OF DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine

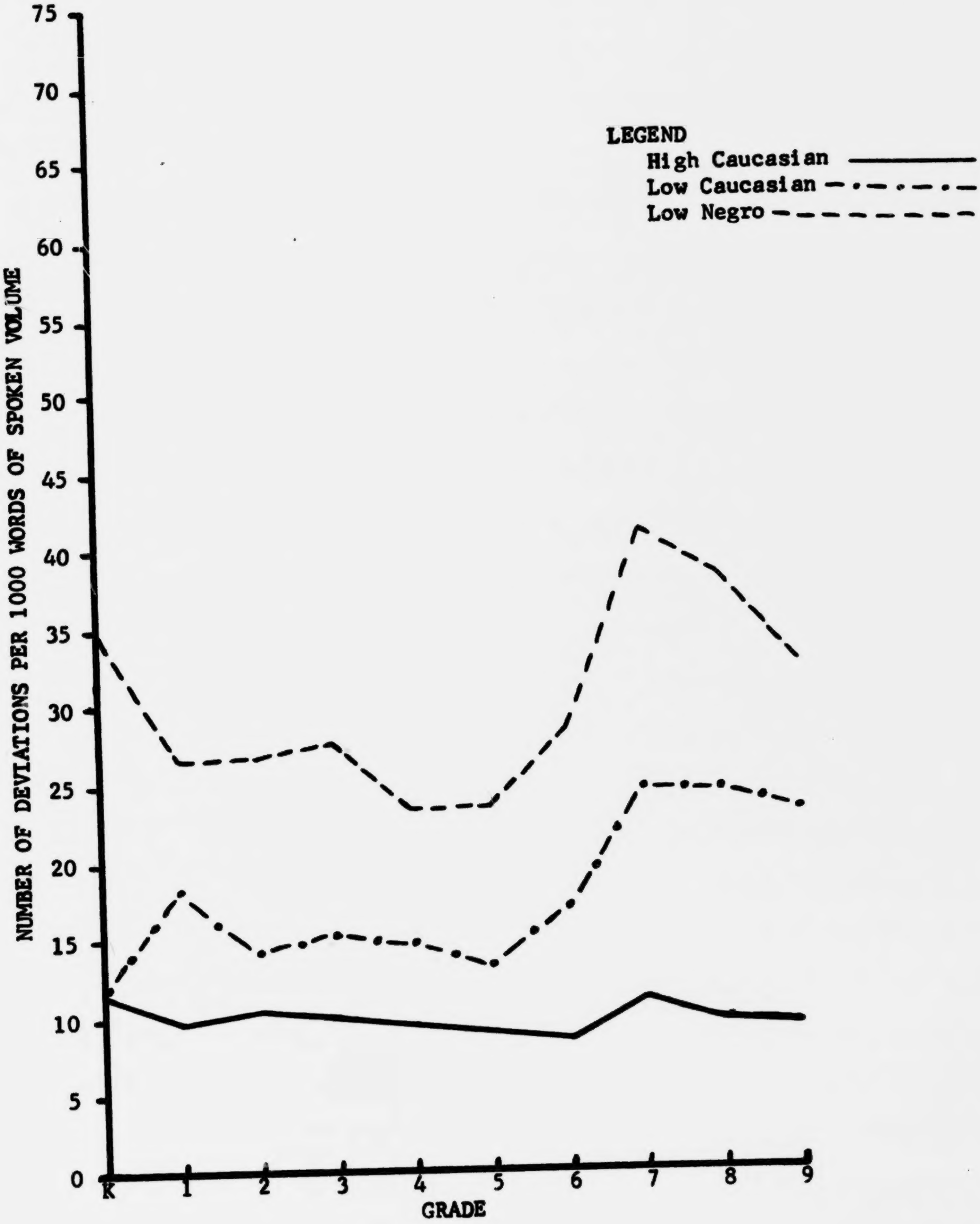


N = 21 for each group.

FIGURE 25

TOTAL NUMBER OF DEVIATIONS PER 1000 WORDS OF SPOKEN VOLUME WITH DEVIATIONS OF ETHNIC ORIGIN (1A, 1D, 1E, 8) SUBTRACTED

High Caucasian, Low Caucasian, and Low Negro Groups
Grades Kindergarten through Nine



N = 21 for each group.

Comparing Figure 24 to Figure 25 makes it obvious that the Low Caucasian group performs better than the Low Negro group in either case (with ethnic deviations retained or with ethnic deviations subtracted). However, the magnitude of difference between the two graphs is tremendous. When those deviations which are basically Negro in origin are subtracted, the two groups move much closer together, particularly in the early years. In other words, the Low Negro group seems to be expending much of its energy *in overcoming deviations which Caucasian subjects never encounter*.

Of course, this has tremendous implications, particularly for raising the socio-economic level of the Negro generally as well as for integrating the school system more completely. Negro children obviously need to listen and communicate in situations where they can hear more standard usage than can be heard in segregated or nearly segregated schools. All children need to acquire standard usage--not because it is correct, but because society will exact penalties on those who do not. The schools are not interested in perpetuating false or snobbish dogmas about language. Teachers realize that human worth cannot be measured by the speech a man uses. However, in the world to which their pupils go, language is a mark of social and educational status. Because of language, many people are denied access to economic opportunities or entrance to social groups. The leaders of most communities are sensitive to deviations from the informal English which tends to be the standard, accepted language of the community.

CHAPTER FOUR

INTERRELATIONS AMONG THE LANGUAGE ARTS

The extent to which interrelations exist among the language arts is still a matter of speculation. Hildreth states that evidence of such relatedness exists, but her sources prove to be studies showing a positive relation between spelling and reading only.[1] Martin's study of the interrelations among language variables in the first grade produced contrary evidence. "There was little indication that the first grader who talked well would succeed in reading or that the poor speaker would have difficulty in it. Some children who were able to write well did poorly in both speaking and reading. Good readers were poor writers!"[2]

In this research interrelations have been charted for the following factors: oral language with written language; oral language with reading; oral language with listening; reading with written language; reading with listening; and listening with writing. The interrelations extend beyond the first grade and prove to be positive in the years beyond those covered in Martin's study.[3]

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[1] Gertrude H. Hildreth, "Interrelationships between Written Expression and the Other Language Arts," Elementary English, 31 (January, 1954), pp. 40-43.

[2] Clyde Martin, "Developmental Interrelationships among Language Variables in Children of the First Grade," Elementary English, 32 (March, 1955), pp. 167-171.

[3] To a large degree, many interrelations have already been shown. The subjects for the regular high and low groups as well as for the High Caucasian, Low Caucasian, and Low Negro groups were selected on the basis of oral language ratings. Thus oral language ability and many facets of other language ability were shown to be interrelated.

In successive years of the present study, pupils ranked high in their use of oral language also performed well in their writing and reading. Tables 32a, 32b, and 32c classify the subjects in grades four, six, and eight according to their written language ability and present the average reading achievement age and the average oral language rating (teachers' ratings) for each classification.[1] For every year the subjects classified as Superior and High Average in writing have by far the highest reading achievement as well as the highest oral language rating, and there is a steady decline in both reading and oral language ability as one reads down the columns from Superior to Illiterate in writing ability.[2] Even more striking are data indicating the number of subjects reading above or below their chronological age. Every subject who writes at a Superior level and the great majority who write at a High Average level read above their reading age. On the other hand, every subject who writes at the Illiterate level and virtually every subject who writes at the Marginal level reads below his reading age. This is true for every year studied without exception.[3]

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[1] To keep the tabular and graphic presentation within some reasonable limit, spaced years have been presented rather than every year on which data are available. Ordinarily, grades three, six, and nine would have seemed the most desirable to present since these are terminal years in the typical school system. However, reading achievement tests are rarely given at the third grade level, and grade nine seems to be a year in which many schools in the geographical area of this study reduce the number of reading achievement tests administered.

[2] The reader should note that in grade eight (Table 32c) one tends to get the impression that the reading ability of the Superior group has declined. This is a result of what the researcher pointed out earlier in connection with reading: the Stanford reading test has a maximum possible score which the subjects extremely proficient in language have already reached at grade six; as their chronological age increases, the test allows them no alternative but to score lower than they had at a younger age.

[3] The same statements hold true for grades five, seven, and nine although these have not been presented.

TABLE 32a

INTERRELATIONS AMONG READING, WRITING, AND ORAL LANGUAGE

Total Group of Subjects in Grade Four

Written Language: Classification of Subjects	Number in Group	Number Reading Above Chronological Age	Number Reading Below Chronological Age	Average Reading Achievement Above or Below Expected Age Norm[1]	Oral Language: Average Teachers' Ratings
I Superior	2	2	0	+3-2	4.44
II High Average	59	53	6	+1-6	3.75
III Low Average	98	52	46	+0-2	3.35
IV Marginal	44	6	38	-1-6	2.80
V Illiterate	11	0	11	-2-2	2.78
TOTAL GROUP	214	113	101	+0-1	3.33

[1] Reading achievement scores are shown in years and months above or below chronological age (indicated by plus or minus). The dash between the numbers separates years and months.

TABLE 32b

INTERRELATIONS AMONG READING, WRITING, AND ORAL LANGUAGE

Total Group of Subjects in Grade Six

Written Language: Classification of Subjects	Number in Group	Number Reading Above Chronological Age	Number Reading Below Chronological Age	Average Reading Achievement Above or Below Expected Age Norm[1]	Oral Language: Average Teachers' Ratings
I Superior	21	21	0	+3-6	4.08
II High Average	102	83	19	+1-6	3.52
III Low Average	73	20	53	-0-9	3.01
IV Marginal	22	0	22	-2-7	2.61
V Illiterate	4	0	4	-3-6	2.53
TOTAL GROUP	222	124	98	+0-5	3.15

[1] Reading achievement scores are shown in years and months above or below chronological age (indicated by plus or minus). The dash between the numbers separates years and months.

TABLE 32c

INTERRELATIONS AMONG READING, WRITING, AND ORAL LANGUAGE

Total Group of Subjects in Grade Eight

Written Language: Classification of Subjects	Number in Group	Number Reading Above Chronological Age	Number Reading Below Chronological Age	Average Reading Achievement Above or Below Expected Age Norm[1]	Oral Language: Average Teachers' Ratings
I Superior	19	19	0	+2-3	3.87
II High Average	69	57	12	+1-4	3.51
III Low Average	86	20	66	-1-6	2.90
IV Marginal	14	2	12	-3-1	2.51
V Illiterate	2	0	2	-5-7	2.16
TOTAL GROUP	190	98	92	-0-3	3.18

---

[1] Reading achievement scores are shown in years and months above or below chronological age (indicated by plus or minus). The dash between the numbers separates years and months.

From the evidence presented in Tables 32a, 32b, and 32c, it seems clear that reading, writing, and oral language ability are all definitely interrelated. However, before drawing any definitive conclusions on these interrelations, the researcher would first like to present a series of tables, bar graphs, and scattergrams pertaining to these three language arts as well as to show the relationship of listening to the other language arts.

The relation between reading and writing in grades four, six, and eight can be seen in Figures 26a, 26b, and 26c. Note that in grade four the Superior group could not be broken into quartiles because N was too low; for the same reason category V (Illiterates) was not graphed in grades six and eight.[1] As can be seen from these bar graphs, the relation between reading and writing seems so striking as to be beyond question.

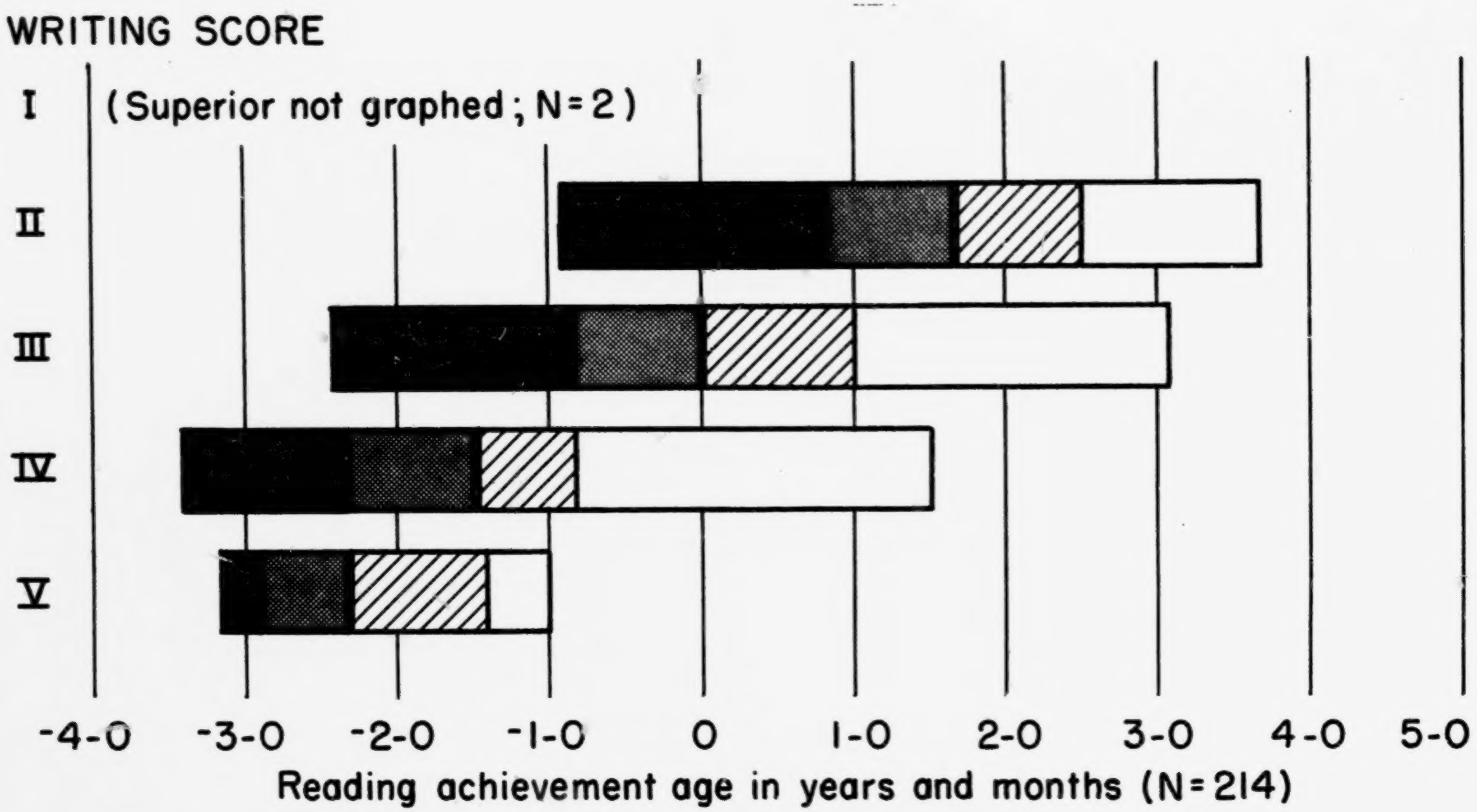
---

[1] Tables 32a, 32b, and 32c use the arithmetic mean whereas the bar graphs use medians and quartiles. Either statistical measure obviously produces the same picture.

FIGURE 26a

RELATION BETWEEN READING AND WRITING
WRITTEN LANGUAGE SCORES COMPARED TO READING ACHIEVEMENT ABOVE OR BELOW CHRONOLOGICAL AGE

Total Group of Subjects in Grade Four

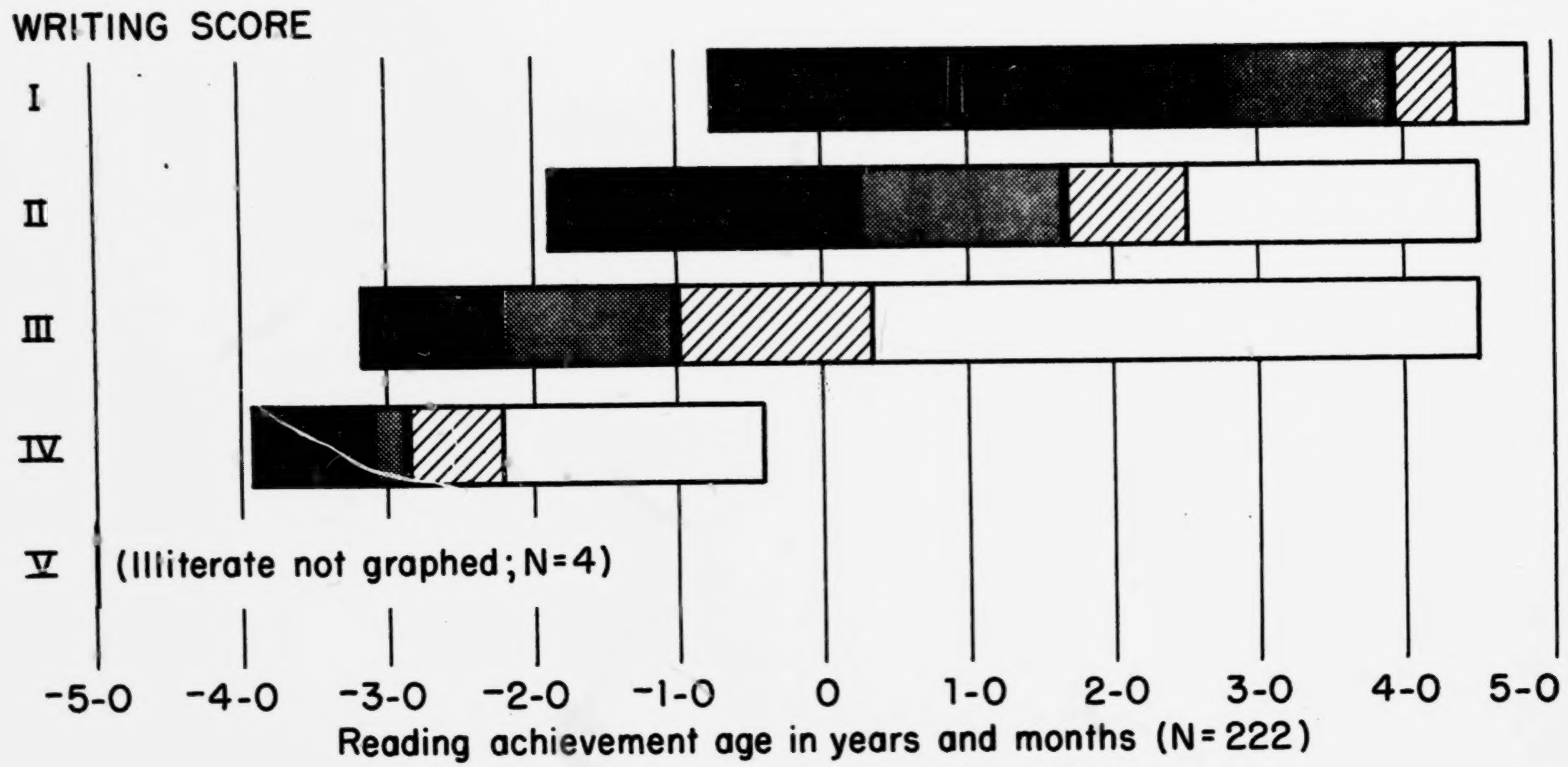


Wide band indicates median; quartiles are indicated by cross hatch

FIGURE 26b

RELATION BETWEEN READING AND WRITING
WRITTEN LANGUAGE SCORES COMPARED TO READING ACHIEVEMENT ABOVE OR BELOW CHRONOLOGICAL AGE

Total Group of Subjects in Grade Six

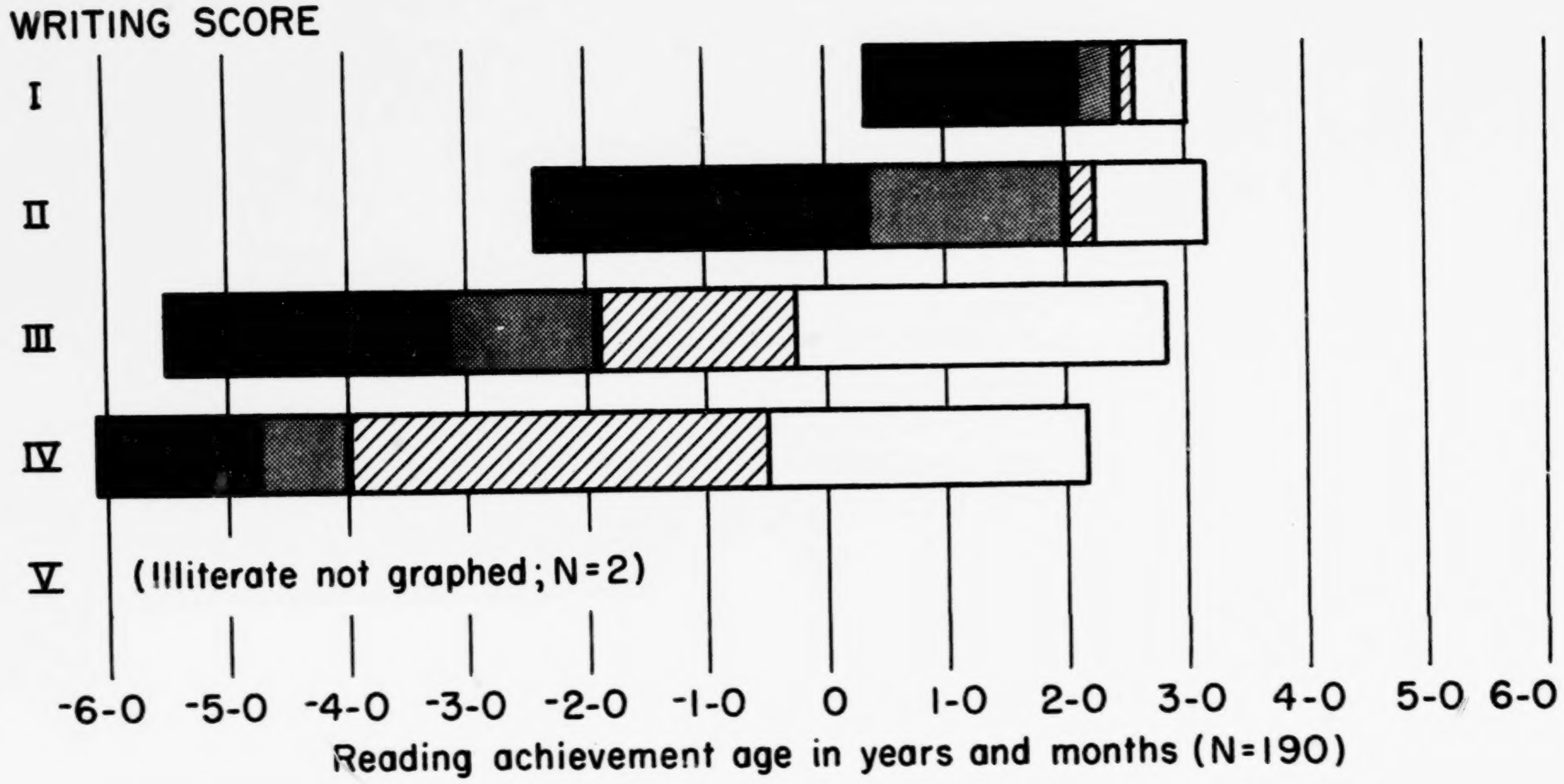


Wide band indicates median; quartiles are indicated by cross hatch

FIGURE 26c

RELATION BETWEEN READING AND WRITING
WRITTEN LANGUAGE SCORES COMPARED TO READING ACHIEVEMENT ABOVE OR BELOW CHRONOLOGICAL AGE

Total Group of Subjects in Grade Eight



Wide band indicates median; quartiles are indicated by cross hatch

The relation between oral language and reading at grades four, six, and eight can be seen in the three scattergrams presented (Figures 27a, 27b, and 27c). From these data it can be seen that the relationship between these two language arts becomes more pronounced as the years pass. In grade four the scatter is more spread and also shows dispersion in the upper left quadrant. In grades six and eight there is more solidification as well as more concentration in the upper right and lower left quadrants. The solidification in upper right and lower left quadrants, of course, indicates what one expects if the data are related: high scores in one variable are associated with high scores in the other; low scores in one variable are associated with low scores in the other. Therefore, it is clear that there is a definite positive relation between oral language and reading.

FIGURE 27a

RELATION BETWEEN ORAL LANGUAGE AND READING

SCATTERGRAM OF AVERAGE TEACHER'S RATING AND READING ACHIEVEMENT ABOVE OR BELOW CHRONOLOGICAL AGE

Total Group of Subjects in Grade Four

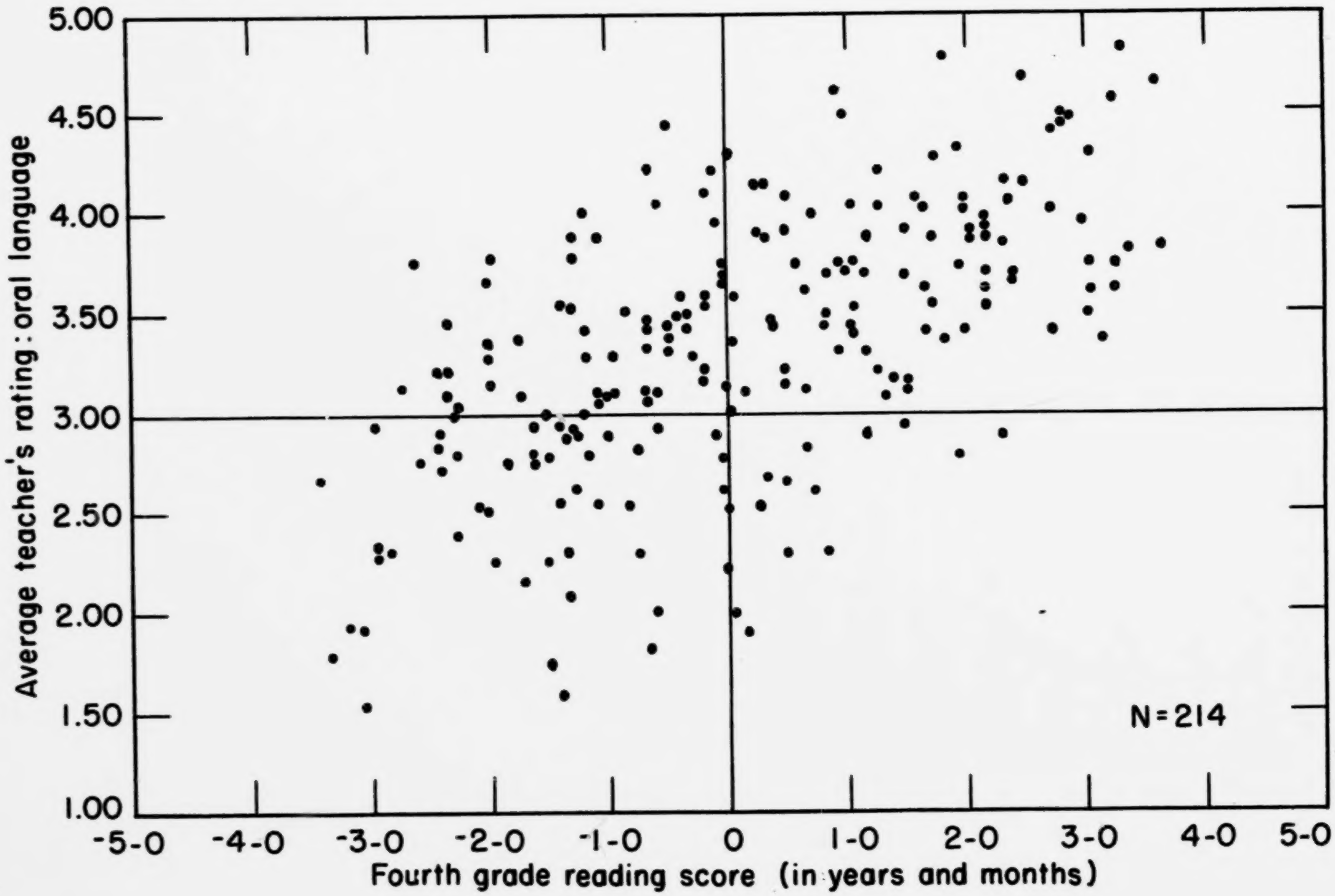


FIGURE 27b

RELATION BETWEEN ORAL LANGUAGE AND READING
SCATTERGRAM OF AVERAGE TEACHER'S RATING AND READING ACHIEVEMENT ABOVE OR BELOW CHRONOLOGICAL AGE

Total Group of Subjects in Grade Six

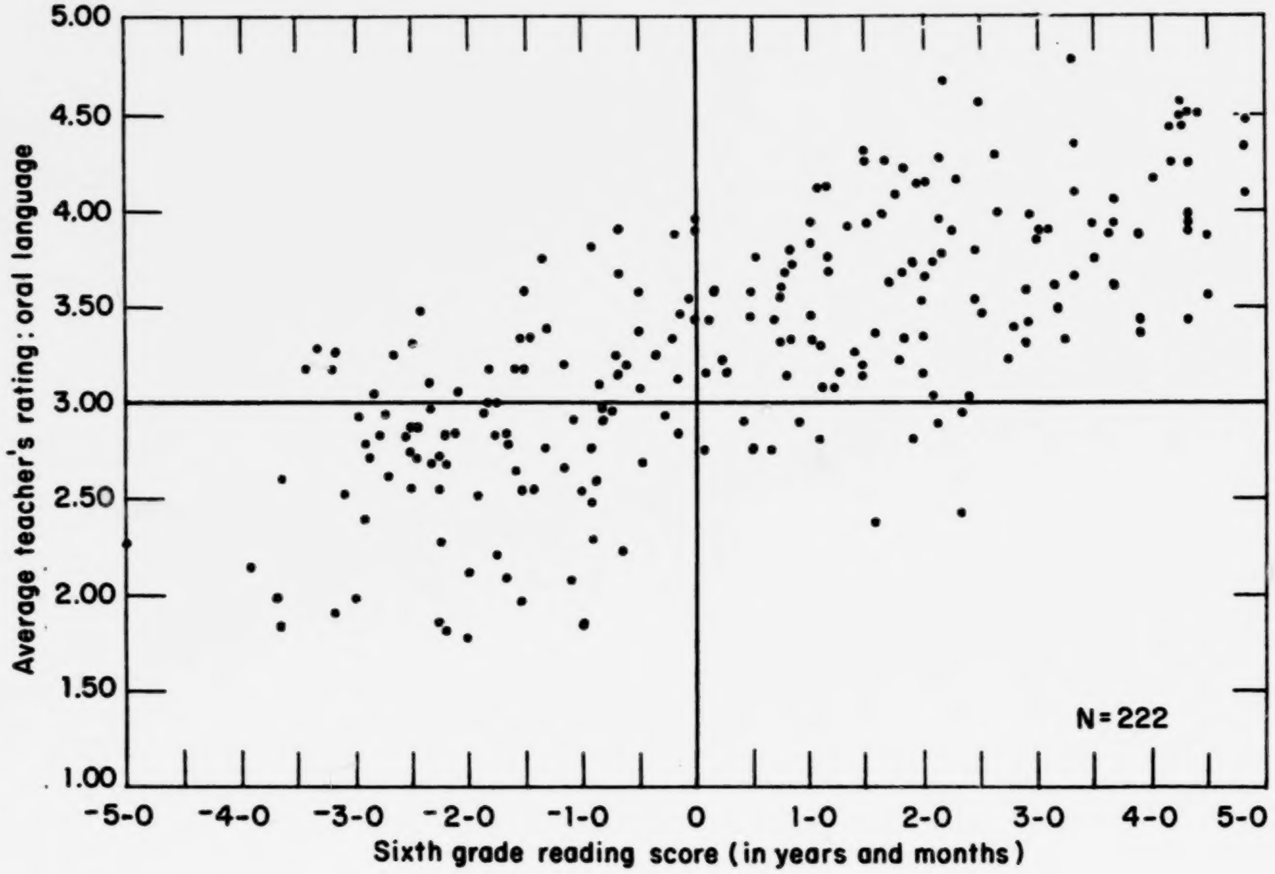


FIGURE 27c

RELATION BETWEEN ORAL LANGUAGE AND READING

SCATTERGRAM OF AVERAGE TEACHER'S RATING AND READING ACHIEVEMENT ABOVE OR BELOW CHRONOLOGICAL AGE

Total Group of Subjects in Grade Eight

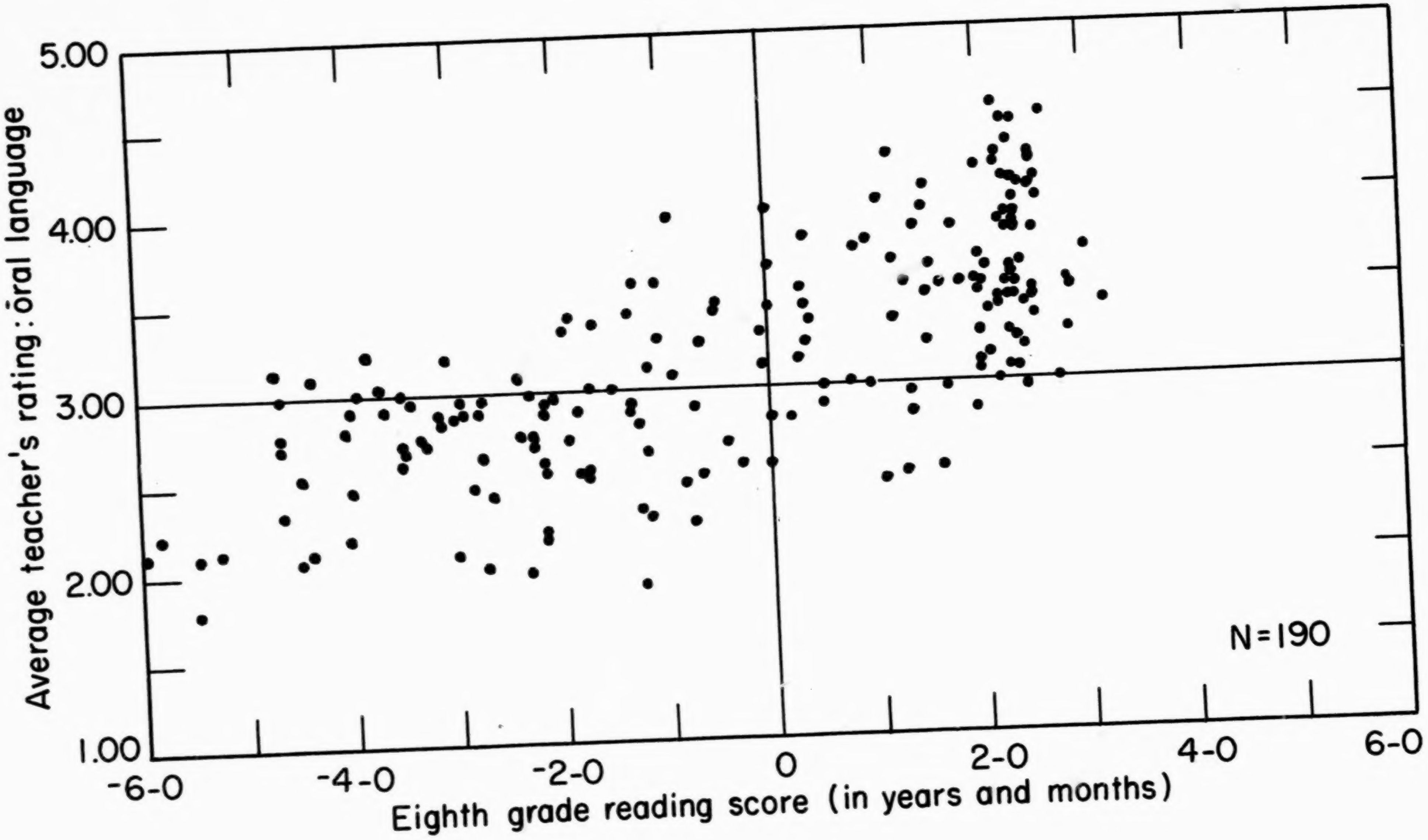


Table 33 shows the relation between oral language and writing. As can be seen, there is considerable overlapping in the total range. However, the medians and inter-quartile ranges indicate a clearly positive relation for all years with the exception of writing categories IV and V in grade four. In all other cases the medians move lower and lower as one goes down the columns from Superior to Illiterate. In addition, the inter-quartile range shows a particularly striking characteristic. There is typically a large overlap on the inter-quartile range when examining any two adjacent writing categories (comparing I to II or comparing III to IV, etc.). However, there is almost never an overlap when comparing writing scores two categories apart (comparing I to III or comparing II to IV), and in cases where there is an overlap it is very slight. In other words, when looking at the central fifty per cent of the subjects in any given writing category, the lowest individual among the better writers is typically higher than the highest individual among the poorer writers. Therefore, it seems clear that the relation between oral language and writing is very definite.

TABLE 33

RELATION BETWEEN ORAL LANGUAGE AND WRITING

Total Group of Subjects
Grades Four, Six, and Eight

Grade Four

Writing Score	Number of Subjects	Median	Inter-quartile Range	Total Range
I Superior	2	----[1]	----[1]	----[1]
II High Average	59	3.75	3.46 to 4.04	2.54 to 4.82
III Low Average	98	3.42	3.01 to 3.81	1.75 to 4.79
IV Marginal	44	2.81	2.38 to 3.08	1.54 to 4.25
V Illiterate	11	2.96	2.33 to 3.14	1.92 to 3.21

Grade Six

Writing Score	Number of Subjects	Median	Inter-quartile Range	Total Range
I Superior	21	4.14	3.67 to 4.46	3.37 to 4.55
II High Average	108	3.56	3.20 to 3.93	1.83 to 4.78
III Low Average	78	2.98	2.73 to 3.31	1.78 to 4.17
IV Marginal	24	2.61	2.12 to 2.88	1.89 to 3.45
V Illiterate	6	2.39	----[1] ----[1]	1.84 to 3.17

Grade Eight

Writing Score	Number of Subjects	Median	Inter-quartile Range	Total Range
I Superior	19	3.87	3.57 to 4.16	3.15 to 4.48
II High Average	69	3.52	3.20 to 3.88	1.88 to 4.56
III Low Average	86	2.90	2.59 to 3.12	1.98 to 3.97
IV Marginal	14	2.49	2.13 to 2.91	1.75 to 3.15
V Illiterate	2	----[1]	----[1] ----[1]	----[1] ----[1]

---

[1] N is too low to have the number indicative of a trend.

Lastly, there is the relation between listening and the other language arts. Figure 28 shows the relation between listening and oral language; Figure 29 shows the relation between listening and reading; and Table 34 shows the relation between listening and writing.[1]

From the two scattergrams (Figures 28 and 29), the relation between oral language and listening and the relation between reading and listening are clearly positive. The relation between listening and writing (Table 34) is also positive although there is a broad overlap on the total range. However, once again the medians and inter-quartile ranges make a sharp differentiation as one moves down the columns.

---

[1] Listening tests were first administered in grade eight and have been continued in grade nine.

FIGURE 28

RELATION BETWEEN ORAL LANGUAGE AND LISTENING
SCATTERGRAM OF AVERAGE TEACHER'S RATING AND CONVERTED SCORE ON STEP LISTENING TEST

Total Group of Subjects in Grade Eight

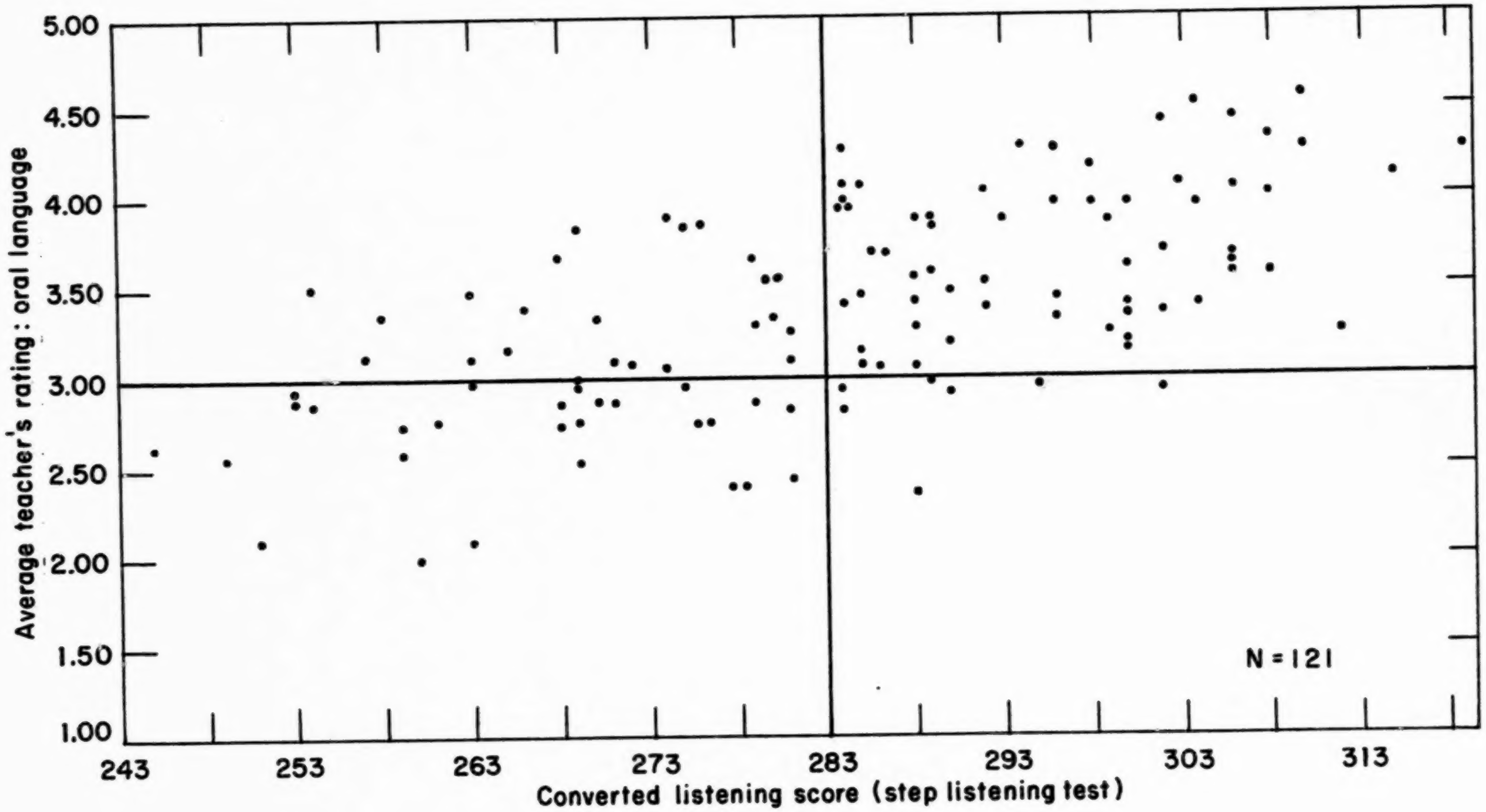


FIGURE 29

RELATION BETWEEN READING AND LISTENING
SCATTERGRAM OF CONVERTED SCORE ON STEP LISTENING TEST
AND READING ACHIEVEMENT ABOVE OR BELOW CHRONOLOGICAL AGE

Total Group of Subjects in Grade Eight

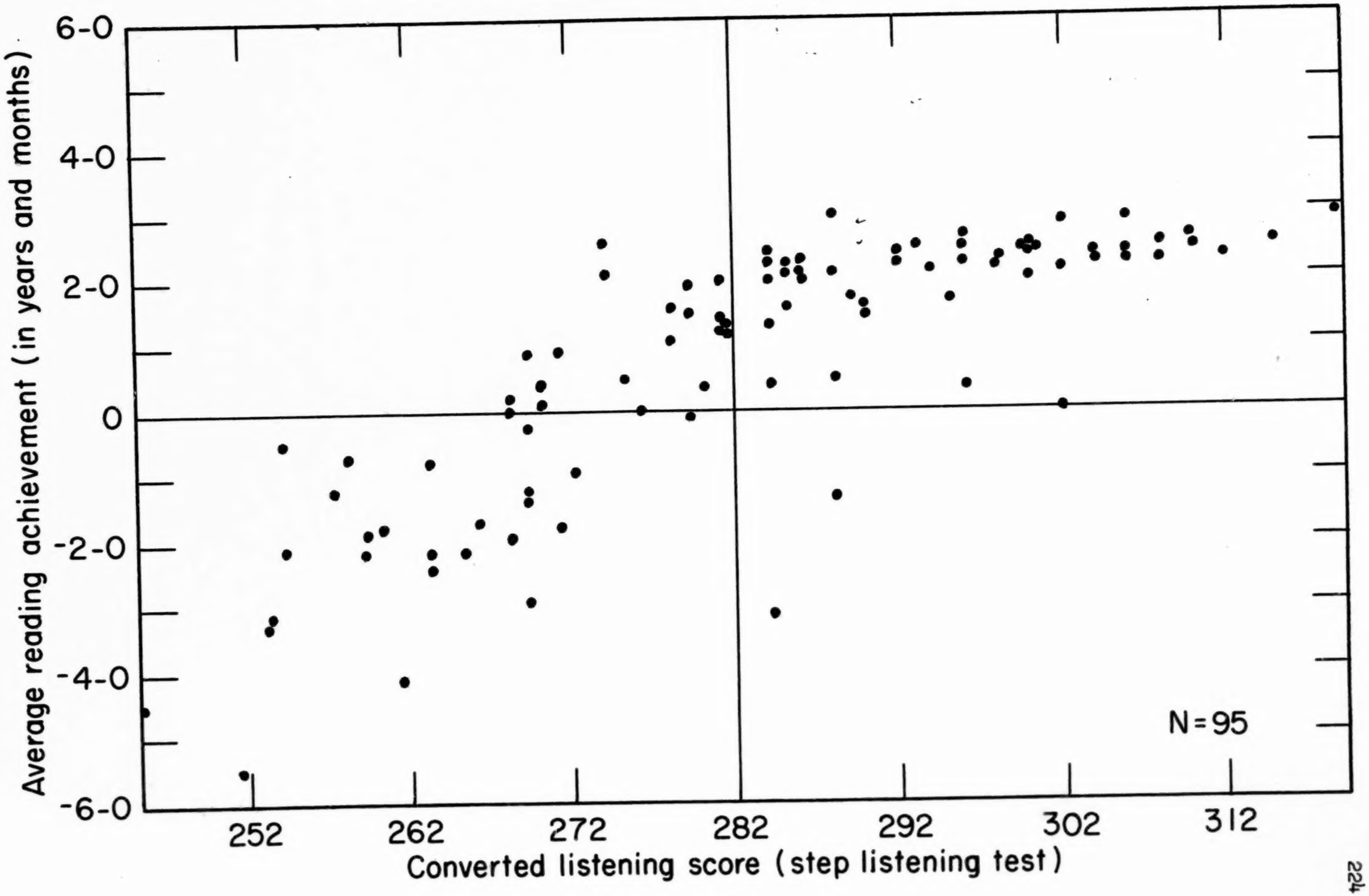


TABLE 34

RELATION BETWEEN LISTENING AND WRITING

Total Group of Subjects in Grade Eight[1]
N = 121

Writing Score	Number of Subjects	Mean	Median	Inter-quartile Range	Total Range
I Superior	18	298	297	287 to 307	279 to 319
II High Average	58	288	288	280 to 300	258 to 312
III Low Average	41	273	269	260 to 284	245 to 308
IV Marginal	4	267[2]	272[2]	---[3] ---[3]	249 to 276
V Illiterate[4]	—	—	—	— —	— —

[1] Using converted listening scores on the STEP Listening Test.

[2] Note that N is only four for the Marginal group. Thus neither the mean nor the median should be taken as significant.

[3] For the Marginal group, N is too low to compute an inter-quartile range.

[4] Only two subjects wrote at the Illiterate level in grade eight, and it was not possible to obtain listening tests on those two subjects.

Between health and language ability relations are positive, but it is difficult to determine a true measure of vitality. Health and energy, as rated somewhat crudely from the health records for each subject, show a low but positive relation with language ability (whether speaking, writing, or reading). Apathy, lassitude, and low vitality appear to be concomitants of low language ability for some subjects. This aspect of the study has been limited by available funds and the lack of an accurate or valid measure of vitality and energy. In the subsequent work of this longitudinal research, further efforts will be made to study these variables more intensely.

The highest correlation in this study, as could be expected, is between vocabulary and intelligence. Using the vocabulary test administered orally in the kindergarten and the Kuhlmann-Anderson group test of intelligence given in the second grade, we obtain a product-moment correlation of .844. As far as the other interrelations among the language arts are concerned, it seems apparent that these are all clearly positive. There will no doubt be individual exceptions, but as a general rule those who read well also write well, speak well, and listen well; those who read poorly also write poorly, speak poorly, and listen poorly.

CHAPTER FIVE

CONCLUSIONS

This study has collected and analyzed language used by the same children from kindergarten through grade nine. In kindergarten there were 338 subjects, and in grade nine 220 subjects remain. One purpose of the research has been to develop methods of analysis which would make possible the scientific study of language in both its semantic and structural aspects. In this first phase of the study, the most important achievement has been the establishment of these objective methods for analysis. By combining the concept of a meaningful syntactic unit with phonological methods of segmentation, and by identifying and dealing with the non-communicative elements, the mazes, a new and useful method of language analysis has been shaped. This method has proved to be a grid against which a wide range of important language phenomena can be silhouetted and measured. With the unit-and-maze grid, it becomes possible to quantify and relate to a solid base line such diverse and significant aspects of language as the following:

flexibility of sentence pattern and of elements within the sentence pattern
proportion of organization and rambling
variations from conventional usage, grammar, and syntax
degree of coherence through subordination
diversity and range of vocabulary
extent to which generalizations occur
freedom from language tangles or false starts (mazes)

amount of language and length of units of communication
number of separate concepts presented
amount of concreteness and abstractness
use of affective verbs and other emotional language
use of figurative language: metaphor, simile, irony, hyperbole, personification.

These are only a few of the possible features to be analyzed by this method; their significance lies in the fact that they represent some of the elements certain to enter into any study of the development of language proficiency. Furthermore, the technique applies to oral or written language equally well, even though mazes are less likely to make an appearance in the written form.

By adding to the basic units of phonology and meaning the concept of the maze, a method has evolved which makes it possible to stabilize a phenomenon as nebulous and fluctuating as human symbolic language. No basis of measurement in language can--or should--ever be as absolute as meters or inches in the exact sciences. Nevertheless, the results of analyzing communication units and mazes are open to independent verification, permitting scientists working separately to reach the same conclusions. Checks on the method prove that two or more workers following the same set of coded directions get the same results within an exceptionally narrow range of minor differences.

SUMMARY OF FINDINGS

1. Fluency with Language

1. During the first ten years of schooling, the subjects speak more words in each succeeding year of measurement; the same is true of the number of communication units, although after grade six the rate of increase on this measure slows considerably as a result of the subjects' using more complexity (reflected by a higher average words per communication unit). The measurement of average words per communication unit is of particular interest. For all groups there is a steady increase indicating more complexity of expression, but the high group always maintains a sizable lead on this measure. Thus the high group uses more words, more units, and greater complexity than does the low group and maintains its initial superiority over those low in language ability. The fact that members of the high group use more communication units than do members of the low group is of particular significance because they are also, through greater subordination, reducing the number of units they need for expression. Even so, they produce more units than the low group.

2. During the first four years of schooling, the subjects as a whole decrease the number of mazes and words in mazes, but the average number of words in mazes increases for the low group. After grade three, both groups increase the amount of mazes and words in mazes while reducing their average words per maze. In the later years (grades four through nine) it becomes increasingly apparent that one must look not at raw figures alone but at percentage relationships. When this is studied it becomes obvious that the high group has far lower a proportion of mazes and words in mazes than does the low group. Thus subjects rated as skillful in language are reducing their proportion of mazes and words in mazes as

well as reducing their average words per maze. In other words, the low group says less than the high group and some of them have more difficulty in saying it.

3. At the kindergarten level, subjects proficient in language have a median score of 67 on a vocabulary test of 100 items and the subjects low in language ability have a median score of 35. Vocabulary and proficiency in language appear to be related at the kindergarten level.

4. A type-token analysis comparing the number of new words used in a measured 100-word segment of language indicates that the high group uses more types (new words) per number of tokens on a segment-by-segment, year-by-year basis. Thus the high group shows greater diversity of vocabulary.

5. An analysis of height of vocabulary using the Thorndike-Lorge word counts on frequency of word occurrence indicates a definite superiority on the part of the high group. New words appearing in each type-token segment were rated, and it was found that the high group uses not only more new words but also more words in every Thorndike-Lorge category. Thus the high group shows greater diversity of vocabulary and greater height of vocabulary.

6. As measured by spoken style of language, the high group is significantly more fluent than a random group selected from the total sample, but their readiness of response does not differ from the random sample. The low group is less fluent than the random group, and there is evidence that they may be somewhat slower to respond in speech.

2. Effectiveness and Control

Structural Patterns

1. The low group uses many more partial expressions--sentence patterns that are incomplete--than does the high group.

2. The high group employs the linking verb sentence pattern to a greater extent than does the low group.

3. The expletive type of sentence pattern (Here is . . . , There are . . .) is seldom used by the low group; for the high group, the use of it first increases and then decreases. The decrease in the use of the expletive type of sentence pattern could be due to stylistic development through instruction as well as reading. Teachers often discourage expletives because they preclude vivid and active expression.

4. In early years, the outer complement pattern is used only by the most able of the high group, and the inner complement pattern (indirect object) is seldom used by either group. For both patterns the incidence of use is slightly more frequent for the high group during most of the later years (grades four through nine), and the patterns show an overall increase although they are still of minor use by either group.

5. Except for the linking verb pattern and the use of partials, the median differences in structural patterns used by the two groups are negligible. An examination of the number of subjects using various sentence patterns indicates that members of the high group show a greater tendency to use the uncommon patterns than do members of the low group. However, there is an overall similarity and this similarity in the use of patterns in oral language is considered to be an important finding of this study, especially when considered in relation to the findings which immediately follow.

Elements within the Structural Patterns

6. Although differences in structural patterns are not notable--with the exception of partials and linking verbs--very important differences do show up in the dexterity with which subjects use elements within these structures. The nominals, whether in subject or object position, and the movable elements show marked differences when low and high groups are compared. This holds true consistently for any syntactical nominal structure. It is assumed from this that predication, when it is studied, will also show similar marked differences. This finding on the elements of structural patterns is considered to be one of the important findings of this study and should be considered in relation to the findings (above) on the similarity of structural patterns. Not pattern but what is done to achieve flexibility within the pattern proves to be a measure of effectiveness and control of language at this level of language development.

7. In the movable elements of the patterns, the high group consistently shows a greater repertoire of clauses and multiples (movables within movables).

8. For subject nominals, the low group depends almost exclusively on nouns and pronouns. The high group can use noun clauses, infinitives, and verbals.

9. For nominals used as complements, both groups use nouns and pronouns with the same frequency, but the high group invariably exceeds the low group in the use of infinitives and clauses.

10. Boys in the low group are clearly more limited in their repertoire of syntax than girls in the low group. On the other hand, boys in the high group tend to excel the girls in the high group.

Tentative Thinking Through the Use of Provisional and Conditional Statements

11. Those subjects most proficient with language are the ones who most frequently use language to express tentativeness. Supposition, hypothesis, and conditional statements occur much less frequently in the spoken language of those lacking skill in language.

Figurative Language and Generalizations

12. Very few examples of figurative language or of generalizations occur in the oral transcripts of the subjects' language.

Reading and Writing

13. Those who are high in general language ability (the high group in this study) are also high in reading ability. Those who are low in general language ability (the low group in this study) are also low in reading ability. In addition, the gap between the high and the low groups is apparently widening from year to year.

14. Reading ability is related to socio-economic position. As one goes down the socio-economic scale, reading ability steadily decreases.

15. Those who are high in oral language ability (the high group) are also high in writing ability. Those low in oral language ability (the low group) are also low in writing ability. At the junior high school level the great majority of subjects in the low group are still writing at a Low Average or Marginal level. The great majority of the high group are writing at a High Average or Superior level.

16. Writing ability is related to socio-economic position. As one goes down the socio-economic scale, writing ability steadily decreases.

17. In written language (as was the case in oral language), many of the sentence patterns used do not differentiate markedly between those ranked high in language ability and those ranked low in language ability.

The high group does use the passive construction and the question construction much more in writing than does the low group; the high group also uses fewer partials. In addition, an analysis of the number of subjects who use certain uncommon patterns shows that a subject ranked high is far more likely to use an uncommon pattern than one ranked low.

Coherence Through the Use of Subordination

18. Adverb and noun clauses are used by the total group much more frequently than adjective clauses.

19. The adverb clause discriminates between the high and low groups better than do the noun and adjective clauses.

20. On an index of subordination in oral language, the high group uses this grammatical complexity to a greater extent than do the random and low groups. This precedence over the other two groups is consistent throughout all ten years of the study.

21. All three groups show an increasing use of subordination as chronological age increases.

22. The boys in the low group use consistently less subordination than do the girls in the low group. On the other hand, the boys in the high group exceed the girls in four out of the first seven years of their schooling.

23. An analysis of subordination on written language indicates that the high group is superior on this measure to both the low group and the total group for all years except grade nine. In grade nine the total group actually exceeds the high group, and this development is being followed in order to determine if it is a new trend or merely a quirk in the data.

24. Transformational grammar, applied to two subjects, indicates that this kind of analysis is a valuable method of studying grammatical complexity. The girl from the low group was shown to be at least two years behind the boy from the high group in development of grammatical complexity.

25. Both the index of subordination and the transformational analysis show complexity of grammatical structure to be associated not only with chronological age but also with proficiency in language and with socio-economic status. This is particularly interesting in relation to the theoretical explanation of this phenomenon published by the British linguist, Bernstein.

Coherence Through the Use of Subordinating Connectives

26. The use of subordinating connectives increases with chronological age, mental ability, language ability, and socio-economic status.

Coherence Through Control of Mazes

27. From kindergarten through grade three, both the low group and the high group continue to have difficulties with language tangles, or mazes as they are called in this research. On number of words per maze the standard deviation is decreasing for the high group and is erratic for the low group. Apparently all of the high group members are gaining control of mazes, whereas the members of the low group are varying more in controlling these tangles. However, beginning with grade four the low group does show considerable improvement in controlling words per maze.

Coherence of Spoken Style

28. The high group seems to be no more coherent in spoken style than the random group, whereas the low group is less coherent than the random group. The statistical evidence on this measure is not free from the possibility of error (some cells in the chi-square method contained fewer than six cases).

SUMMARY OF MASTERY OF CONVENTIONAL USAGE AND GRAMMAR

1. A preliminary study of the data indicated that some deviations are ethnic in origin and as a result three special subgroups were selected. These were designated High Caucasian, Low Caucasian, and Low Negro.

2. The three groups showed a consistent relationship to each other on such measures as total words in units, average words per unit, reading ability, writing ability, ability to use subordinating connectives, I.Q., and socio-economic status. They were thus considered homogenous units which could be studied statistically.

3. At the kindergarten level, on the agreement of subject and verb in the third person singular (excluding all forms of the verb to be), the Low Negro group has twelve times as much difficulty as the Low Caucasian group and over 100 times as much difficulty as the High Caucasian group. By grade nine the Low Negro group has improved considerably on this agreement but still has substantially more difficulty than either Caucasian group.

4. At the kindergarten level, on the omission of auxiliary verbs, the Low Negro group has five times as much difficulty as the Low Caucasian group and sixteen times as much difficulty as the High Caucasian group. Again, the Low Negro group improves considerably by grade nine.

5. On the use of nonstandard verb forms, the Low Negro group has twice as much difficulty as the Low Caucasian group and four times as much difficulty as the High Caucasian group. Again the Low Negro group shows improvement by grade nine.

6. On the nonstandard use of possessives and on double negatives (two categories combined) the Low Negro group has seven times as much difficulty as the Low Caucasian group and sixteen times as much difficulty as the High Caucasian group. In this case the Low Negro group shows almost no improvement from kindergarten through grade nine.

7. On the various other deviations, the picture typically shows the High Caucasian group with least difficulty, the Low Caucasian group with some difficulty, and the Low Negro group with the most difficulty.

8. On total deviations, there is an abrupt increase at grade five for both low groups and a slight increase for the High Caucasian group. This indicates that as complexity increases (demonstrated by an increased average words per unit), there is a more than proportional increase in deviations from accepted English usage.

9. When deviations of ethnic cultural origin are subtracted from all three groups, the Low Negro group moves considerably closer to the other two. This indicates that the Low Negro group is expending much of its energies in overcoming deviations which Caucasian subjects never encounter.

10. The findings on those deviations from accepted usage which are ethnic in origin indicate strongly a need for raising the socio-economic level of the Negro and for having a more complete integration of the school system. Negro children obviously need to listen and communicate in situations where they can hear more standard usage--not because

standard usage is "correct" but because standard usage helps to provide access to opportunities and entrance to a wider range of social groups.

SUMMARY OF INTERRELATIONS AMONG THE LANGUAGE ARTS

1. In this study, reading, writing, listening, and speaking show a positive relation when each of these language arts is compared to any other. Since the language of a people is their oral language (writing and print are methods based on the oral language), listening and speaking appear to be the crucial foundations of proficiency in all language.

2. At all grades, those who read well also write well, have the highest oral language ratings, and perform best on listening tests. The medians, inter-quartile ranges, and scatters (on those data presented on scattergrams) indicate clear and positive relationships when any language art is compared to any other. There is overlapping to some degree as indicated by the total ranges on various measures and the dispersion on scattergrams, but for the most part these are individual exceptions.

3. The highest correlation in the study is between vocabulary and intelligence as measured by the Kuhlmann-Anderson group test of intelligence. The product-moment correlation is .844. Vocabulary, success with group tests of intelligence, and proficiency with language constitute a cluster of traits (or, possibly, they are different manifestations of the same trait).

4. There is a low but positive relation between health and language proficiency. The measure of health used in this study is a crude measure, and the relation may well be higher.

A CONCLUDING STATEMENT

This research has achieved one of its major aims, the development of a fundamental method of analysis for studying children's language and for locating features of language meriting further study. How children vary in proficiency with language has also been charted in numerous ways, but clearly determined stages of development remain as yet unmarked. The data collected contain the evidence for such research as well as numerous other possibilities. As time permits, these possibilities will be pursued.

The most significant features to emerge from the work accomplished so far appear to be these:

. . . Not basic sentence pattern but what is done to achieve flexibility within pattern proves to be a measure of proficiency with language at this level. Since formal instruction in grammar--whether linguistic or traditional--seems to be an ineffective method of improving expression at this level of development, one can conclude that elementary pupils need many opportunities to grapple with their own thought in situations where they have someone to whom they wish to communicate successfully. Instruction can best aid the pupils' expression when individuals or small groups with similar problems are helped to see how their own expression can be improved. This instruction would take the form of identifying elements which strengthen or weaken communication, increase or lower precision of thought, clarify or blur meanings. For the pupils the approach would usually be through models, meaning, and reasoning rather than through the application of rules. On the other hand, the teacher would need to be aware of the structural problems behind the semantic difficulties and would be guided by research in determining what to emphasize or to ignore. Inductive reasoning toward generalizations would be more frequently encouraged than deductive applications to sentences not of the pupils' own creating. Occasionally the effectiveness or ineffectiveness of important ideas read or heard (e.g., recorded on tape) would be examined as a profitable reversal of self-expression through speaking and writing. Attention to structure at the expense of emphasizing successful communication could be a dangerous contribution of research not carefully interpreted.

. . . In this study the superiority of the high group in handling oral signals effectively--their skill at using pitch, stress, and pause--combined with their relative freedom from using partial structural patterns is impressive. It would be difficult not to conclude that instruction can yet do more than it has with oral language. Many pupils who lack skill in using speech will have difficulty in mastering written tradition. Competence in the spoken language appears to be a necessary base for competence in writing and reading. Modern equipment for recording and studying the spoken word makes possible marked advances in such instruction.

. . . Like the less proficient subjects' use of partial constructions, mazes used by all subjects in this study are impressive as a phenomenon of major significance. Their causes and a deeper study of their nature deserve a high priority in the next phase of the present research.

. . . The frequently recurring pattern of boys at the extreme ends of a number of measures is interesting. Whatever the causes, cultural or genetic, boys in this study do very poorly in language when they are low in language ability and excel when they are high in language ability.

. . . The persistently parallel variation of language proficiency and socio-economic status should not be overlooked. It appears entirely possible that language proficiency may be culturally as well as individually determined. If children reared in families at the least favored socio-economic positions receive a restricted language experience, if their early linguistic environment stresses only limited features of language potential, such children may indeed be at a disadvantage in school and in the world beyond school.

. . . The remarkable retention of subjects in this ten-year period of a longitudinal study (in a nation whose people are noted for moving about) is attributed to the persistence of the research staff and the fortunate fact that few families want to move away from the San Francisco Bay area. Even more remarkable has been the retention of subjects from the least favored socio-economic groups. From the beginning it has been the policy of this research to avoid a sample skewed in the direction of upper class groups.

. . . Research studies of this kind are like preliminary explorations on a vast continent. The possibilities for greater knowledge of language behavior seem limitless.

APPENDIX

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Research Study: Language Development

TEACHER'S EVALUATION OF LANGUAGE SKILL

Name of pupil . . . . (last name first)

Date of Rating . . . . (month) (year)

Teacher . . . .

TO TEACHERS

Your help on the following points will be greatly appreciated. In rating each item, disregard your ratings for that pupil on every other item; try not to let general impressions color your judgments about specific aspects of the pupil's language. We would most certainly appreciate any comments, illustrations or noteworthy episodes that throw light on the ratings. If you can give us the time, write them in any empty space or on the last page.

Number 1 is LOW and is described by the words at the left-hand side of the scale.

The numbers 2, 3, and 4 represent degrees between HIGH (5) and LOW (1).

Number 5 is HIGH and is described by the words at the right-hand side of the scale.

PLEASE CHECK BY ENCIRCLING THE NUMBER APPROPRIATE IN EACH CASE.

EXAMPLE: You consider a pupil just slightly better than average on a certain skill. You circle the number four, as follows:

1 2 3 ④ 5

	LOW		HIGH
1. Skill in communication	incompetent with all language; no awareness of listeners; speaks without trying to evoke understanding from others; halting pace of words and inflections of voice not adjusted to listeners; writes like an illiterate person	1 2 3 4 5	uses language in any form with power, proficiency, and pleasure; adjusts pace of words and inflection to listeners; uses an "imparting tone"; is aware of need to make self understood; writes competently with a sense of style

		LOW		HIGH
2.	Organization, purpose, and point	rambles, no sense of order or of getting to the point; rattles on without purpose; cannot tell a story or express ideas in a suitable sequence	1 2 3 4 5	plans what is said; gets to the point; has control of language; can tell a story or express ideas in a suitable sequence
3.	Wealth of ideas	seldom expresses an idea; appears dull and unimaginative; doesn't originate suggestions or plans	1 2 3 4 5	expresses ideas on many different topics; makes suggestions on what to do and how to carry out class plans; shows imagination and creativity in many ways
4.	Fluency	seldom talks; exceptionally quiet; needs to be prompted to talk; overly laconic	1 2 3 4 5	talks freely, fluently, and easily; also talks brilliantly and effectively
5.	Vocabulary	uses a meager vocabulary, far below that of most pupils this age; inarticulate, mute.	1 2 3 4 5	uses a rich variety of words; has an exceptionally large, effective, and growing vocabulary; speaks fluently with vocabulary suited to listeners
6.	Quality of listening	inattentive, easily distracted; seldom attends to the spoken language of others; doesn't listen for relationships or note how main ideas control illustrations or subordinate ideas	1 2 3 4 5	superior attentiveness and understanding of spoken language; a creative listener
7.	Quality of writing	lacks coherent organization; often does not follow conventional usage and spelling; a very poor writer	1 2 3 4 5	organizes in terms of a purpose; excludes irrelevant materials; subordinates elements not to be stressed; uses appropriate style, acceptable usage, and conventional spelling; a superior writer

	LOW		HIGH
8. Reading	reads only what he has to read; "deciphers" print rather than reads it; gets no ideas from books; will not very likely read more than newspapers and magazines (if that) when schooling is over	1 2 3 4 5	reads voraciously, easily, and with interest books of merit and difficulty; absorbs ideas from books easily and accurately; will undoubtedly read much all throughout life

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	LOW		HIGH
1. Activity	listless, apathetic, passive; has very little to do with others; prefers to sit; has low energy level; has slow reactions; seems always tired	1 2 3 4 5	very active; relates easily and freely with others; has a high energy level; enjoys physical activity; has quick reactions; seems exceptionally vital and alive
2. Acceptance or rejection	rejected by others, disliked; almost never chosen by others or included in activities; almost entirely isolated	1 2 3 4 5	notably popular with everyone; others seek his company; never lacks companionship; always included in peer-group activities

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OTHER COMMENTS:

Your comments here on the language or general adjustment of this pupil are most helpful to the research. Any comments will be of great interest to us and deeply appreciated. (Use other side if necessary.)

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8 / 30 / 65